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The Research and Standardization Work of the Government Printing Office

by

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A survey of the work of the Division of Tests and Technical Control on paper, type metals, and other materials used by the Printing Office

In 1922 Public Printer George H. Carter established a testing section in the Government Printing office for the purpose of testing materials offered and delivered for use by the office. The testing section was also to conduct research in the various branches of the printing industry, to prepare or assist in the preparation of specifications for the purchase of materials, and to exercise technical control over the quality and production of materials manufactured in the office, such as type metals, printing, ruling and writing inks, rollers, detergents, etc.

The Printing Act of 1895 requires that "the Public Printer shall compare every lot of paper delivered by any contractor with the standard of quality fixed upon by the Joint Committee on Printing and shall not accept any paper which does not conform to it in every particular." Prior to the establishment of the laboratory in the Government Printing Office it was necessary for the Public Printer, in order to comply with the law, to send samples from each delivery of paper to either the Bureau of Standards, Department of Commerce, or to the Bureau of Chemistry and Soils, Department of Agriculture, to be tested for compliance with specifications. This procedure was unsatisfactory, due to the time required for such tests. The other departments were not in a position to give the Government Printing Office samples priority over their own work and printing presses were at times held up awaiting reports on tests which could have been made in a short time had the office been equipped to do its own testing.

In addition to paper the Government Printing Office purchases large quantities of other supplies such as metals, ink-making materials, adhesives, bookbinding textiles, leathers, and threads. It was not practicable to send such a variety of samples to laboratories located in other parts of the city since this procedure would have delayed the work of the office. Installation of the laboratory in the Government Printing Office expedited tests on paper and also permitted other materials to be tested in order to determine their compliance with specifications.

The printing industry has been under less technical control than any other large industry in this country. The Government Printing Office, with its wide variety of printing processes, offers a fertile field for technical research. A plant laboratory is essential in obtaining the best results in research on plant processes since only in this manner can the proper contact be maintained between the technical worker and actual plant operations. The research worker dealing with materials and processes in a manufacturing plant should have accurate knowledge of the conditions under which such materials are used and information concerning the various processes, otherwise the maximum benefits from such research can not be obtained.

New Specifications Developed

One of the first duties of the testing section was to determine the most suitable quality of each of the numerous materials used by the office and then develop specifications or modify existing specifications in order to obtain the quality desired. In some cases existing trade specifications were adequate, but many of the materials used, such as adhesives and ink-making materials, had not been standardized. Considerable research was necessary in order to determine the exact qualities desired and develop specifications which would insure the delivery of satisfactory material. This in turn entailed testing of all deliveries of such materials to insure their compliance with the specifications. All the materials purchased by the office could not be standardized in a short time but the work has proceeded steadily until now practically every material used by the office is purchased on definite technical specifications.

As the technical control work of the laboratory expanded, other sections of the office were added

to the testing section until it was finally made the Division of Tests and Technical Control which was divided in four sections: the laboratory; the roller and glue section, which manufactures all adhesives and rollers used in the office; ink section, which manufactures all printing, writing, and miscellaneous inks used by the Government Printing Office and also some inks for use by other branches of the Government in Washington; and the metal section, which takes care of the reconditioning of the various type alloys used in the office.

The number of samples tested annually has increased steadily, 8418 samples being tested in the fiscal year ended June 30, 1930. The following tabulation shows the variety of materials tested:

Paper	5583
Textiles	700
Bookbinding leather	91
Metals	1119
Glue	36
Ink-making materials	214
Inks	86
Oils and greases	39
Gasoline	76
Chemicals	109
Miscellaneous	365

Three hundred and eighty-three deliveries of materials were rejected for noncompliance with specifications. Of these rejections 224 were of paper, 68 of envelopes, the remainder being miscellaneous materials.

Among the various problems which have been studied are flax book twine, detergents, printing ink ingredients, ruling dyes, type metal alloys, glue for bindery purposes and roller manufacture, bronze stamping leaf, and bond and ledger papers. The results of research on paper have been of considerable assistance to the Paper Specifications Committee of the Joint Committee on Printing in developing specifications for the wide variety of paper purchased for the public printing and binding and particularly in the standardization of Government bond and ledger papers. As a result of this work, five grades each of bond and ledger papers were found ample to meet all requirements of the Government service. The adoption of these grades and definite specifications covering the quality of each grade was recommended by the Paper Specifications Committee and adopted by the Joint Committee on Printing on December 10, 1924. The specifications include stock, weight, folding endurance, bursting strength, ash, and acidity. Intangible factors such as color, finish, formation, cleanliness, and opacity are covered by standard samples.

Research on kraft papers results in the adoption of definite specifications covering the quality of paper to be used in the manufacture of kraft envelopes for Government use. The results obtained by use of these specifications during the past few years has amply justified their adoption.

Control of Type Metal

There are approximately 6,000,000 pounds of linotype, monotype, electrotype, and stereotype metals used in the Government Printing Office, approximately 30,000 pounds of which are used daily. Technical control of these alloys was started in 1925. It was found that the composition of each alloy differed widely, even from day to day, and that no definite composition of any of the alloys had been maintained. It was therefore necessary to ascertain the most desirable formula for each of the alloys, as determined by the use requirements of the office and then to standardize them accordingly.

The linotype metal, for instance, was found to contain an excessive amount of tin, due to previous "rule-of-thumb" corrections. In order to correct this metal economically to a composition which would give satisfactory results, it was necessary to determine the highest percentage of tin which would permit maximum production of good slugs and then standardize the metal to this percentage in the remelting pots. It was also necessary to determine the most desirable percentage of antimony. Practical tests were made on a number of alloys containing varying percentages of these metals, with the result that 4.5 per cent tin, 11.5 per cent antimony, with a maximum of .10 per cent and preferably less than .05 per cent copper, and the remainder lead constituted the most satisfactory alloy. However, equally good results were obtained on metal containing as low as 4.0 per cent tin. The formula of 4 to 4.5 per cent tin, 11.5 per cent antimony, copper not to exceed .05 per cent, and remainder lead was adopted as being satisfactory for the work of the office. It was found most practicable to standardize this metal as it was returned for remelting. An average of two 10,000 pound lots are remelted, analyzed, corrected to the standard formula, properly alloyed, and pigged for use daily.

The other type metal alloys were standardized in the same manner. Since type metal alloys deteriorate with each remelting, it is necessary in handling large quantities as used in the Government Printing Office to maintain their composition by daily analyses and correction of the metals as each of them are returned for remelting. Over eight and one-half million pounds were standardized during the 12 months ended June 30, 1930.

Technical control of type metal has resulted in production of better quality printing and maximum output of good production with the minimum amount of resetting. Longer runs and cleaner printing have resulted from both type forms and stereotype plates. It has been estimated that the savings to the office in the standardization and technical control of type metal alloys alone has amounted to more than the total cost of the installation and operation of the entire laboratory since its founding, including a new modern laboratory which is the last word in scientific equipment designed primarily for research and technical control in printing work.

Research on glue resulted in the development of specifications for three grades of dry glue which are used in the manufacture of flexible glues according to formulas worked out by the office and also in the manufacture of rollers. Waste roller composition, instead of being thrown away, is now reclaimed for use in bindery adhesives. Prior to the adoption of the specifications glue was purchased on sample, the choice being made as the result of practical tests. These tests were of necessity inaccurate and the awarding of the annual contracts required testing from 40 to 50 samples. Since the adoption of these specifications, awards have been made on specifications and no difficulty has been experienced either in obtaining glue complying with these specifications or in the use of the glue in the plant. Research on adhesives resulted in the development of formulas for flexible glues for the various classes of work and in improved methods of handling the glue in the plant. A marked improvement has been noted in the quality of the work.

Bookbinding materials such as buckram, book cloth, imitation leather, and flax sewing twine have been standardized and definite specifications drawn for use in their purchase. This does not mean that new developments are not welcomed. On the contrary, new materials are constantly being studied and the results applied in plant use.

Research Associates at Printing Office

Technical research is also conducted by the Government Printing Office under the research associate plan, by which any association or group in the printing industry may place their technical men in the Government Printing Office laboratory to work under the supervision of the Public Printer. Two associations, the Mechanical Department of the American Newspaper Publishers Association and the Employing Bookbinders of America, now maintain research associates at the Government Printing Office to study definite problems agreed upon by the respective associations and the Public Printer. The association pays the salary and traveling expenses of their representative and the Government Printing Office furnishes the necessary laboratory and plant facilities for the research work.

In addition to the standardization of materials and processes in the Government Printing Office a considerable amount of simplification and standardization has been done under the direction of the present Public Printer. Prior to 1922 there were more than 50 different sizes of publications printed by the Government Printing Office. The need for standardization of these sizes is evident when it is realized that nine different publications varied in dimensions from $^1/_4$ to $^3/_4$ of an inch, requiring the use of several different sizes of paper for economical printing. The simplification of these nine sizes into one size permitted printing all of them from the same size sheet. The more than 50 sizes have now been reduced to eight sizes. Three-fourths of the more than 100,000,000 copies of the various publications are printed in octavo or quarto sizes.

Standardization of Letterheads

Letterheads were standardized in 1922 by the Permanent Conference on Printing which was organized at the suggestion of the Public Printer. The conference set 8 × $10^1/_2$ inches as the Government standard size, with the quality not to exceed 50 per cent rag. This size is cut from a double demy sheet without waste. The adoption of this standard size has resulted in a savings of approximately $50,000 per year to the Government. The number of sizes of envelopes purchased for Government use has also been reduced to a considerable extent. For instance, those purchased for Congressional use have been reduced from 12 sizes to 4.

The Government Printing Office cooperates with other Government agencies in their research programs in order that there may be no duplication of work. It is represented on the Federal Specifications Board and on numerous Federal Specification committees. The Public Printer is a member of the Executive Committee and the Research and Survey Committee of the Printing Industries Division of the American Society of Mechanical Engineers, the Standardization Committee of the United Typothetae of America, and the first honorary member of the British Printing Industry Research Association. The Technical Director is a member of the Paper Specifications Committee of the Joint Committee on Printing, the Pulp and Paper Committee of the Printing Industries Division of the American Society of Mechanical Engineers, the Paper Testing Committee and Chairman of the Subcommittee on the Ink Resistance of Printing Papers of the Technical

Association of the Pulp and Paper Industry, the Advisory Committee of the Lithographic Technical Foundation on lithographic papers, and the Advisory Committee of the National Research Council on permanent papers. As a further step in its efforts toward standardization, the Government Printing Office has recently become a Member-Body of the American Standards Association. Contacts are also maintained with practically all foreign bodies dealing with standardization in the printing industry and with the leading government and commercial printing plants throughout the world.

British Need Standards for Electrical Accessories

The degree of progress in the standardization of certain electrical accessories in this country is emphasized by a graphic description of conditions existing in England where progress has been less rapid in this field. "D.W.T." writing on the subject of domestic electrical outlets for the *Electrical Times* of London speaks of "the impossible state of affairs which in some cases prevents the householder using a nursery kettle in the kitchen, or the drawing room fire in the bedroom." He continues:

> "Nothing has more surely sickened the public of domestic electrical appliances; nothing will more surely hold back real development. Even if, by studious publicity, the industry can kid the public that these disadvantages are worth enduring for the sake of other advantages, there still remains the other side of the question. At present, electrical contractors have to stock about two dozen plug sockets and plug tops in order to be prepared for any of the amazing variations which may apply in a particular case. This overwhelming stock is as annoying and costly to the contractor—costly therefore to the public ultimately—as is the stock of lamps which must be carried in order to supply them for any desired voltage. The lamp stock question is gradually being solved by the introduction of the standard voltage, but the plug problem, like the poor, is ever with us. I have experienced over and over again a sale conducted on these lines. Voice on telephone: 'This is Mrs. X speaking; I have just bought an electric toaster at Gamrods, but it has on the end of the flex one of those thingummies with little whatsisnames sticking out of it like the brass end of a bulb. Will you send a man to change this for one of those plug things?' Stifling an inclination to say, 'This is not a florist and seedsman, madam,' the contractor replies by asking first whether she wishes to attach the toaster to a lighting or heating circuit. This, of course, she does not know; she probably says lighting because Gamrods told her it would explode on a power circuit. Then starts a game of trying to discover what plug she has available, if any. It all ends up with an electrician being sent around with his pockets bulging with plug tops of 5, 10, and 15 amperes rating; plug tops with two pins, plug tops with three pins; plug tops with fat pins, plug tops with slim pins; plug tops with adjustable centers (abominable things). In half an hour the man is back to say that the plugs are of the two ampere midget type made by a firm in one of the less civilized parts of the country. However, the sale is almost through by now. It only remains to send a messenger around to all the wholesale houses, ring up *The Electrical Times* to find who sells it, place an order with them for stock (the plug top will probably never again be called for), and send the man around to fit it. But it isn't cheap and it doesn't make for development."

Even in the United States, there remains the need for a greater degree of standardization of wiring methods and materials, according to *Electrical Installations*, which says in an editorial in the February issue:

> "The lack of understanding and appreciation of the need for standardization in wiring methods, and on the materials that enter into these methods, is apparent to anyone who is familiar with conditions as they exist today. It is not unfair to say that little has been done by electrical manufacturers to sell dealers and central station representatives throughout the country, to say nothing about electrical contractors and inspectors, on the importance of coordinating both the standards of the National Electrical Code and those standards set up by the Underwriters' Laboratories, all of which must be supported by a united industry in selling electrical service, convenience, and safety to the public at large.
>
> "If the central stations and the contractors are to be expected to cooperate in doing a better selling job, it goes without saying that the manufacturers of wiring materials and equipment must also understand this national problem and do their best to contribute to its solution in terms of simplification and standardization of electrical products."

The Russian Program for Standardization and Elimination of Waste[1]

by

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Eighteen examples of estimates of savings resulting from the use of standards and specifications in various Russian industries

The article from which the following is abstracted begins with a statement of the advantages of a planned socialist economic organization in the setting up and promulgation of industrial standards. There is frequent reference throughout the original article to the importance of participation of workers in the standardization movement. The article will be of special interest to engineers in this country because of the great differences between Russian and American standardization principles.

Following a brief introduction, the author cites numerous examples of savings from standardization:

I

The extent of the savings which may be expected to follow the application of the principle of standardization in production is indicated in the examples given below:

1

Our rolling mills formerly produced a great number of metallic shapes and sections. Before the revolution there were 4742 of them—a product of competition and designers' tricks. The mills had to be stopped once in 24 hours for about four hours to have the rolls changed (a waste of one-sixth the time!). Through the standardization of shapes (U.S.S.R. Standards OST 8-31) the number of shapes and sections was reduced to 715 (less than one-sixth of the original number). This made it necessary to stop the mills only once per week on the average, and as a result of this the productivity of the rolling mills of the Union was increased by 16 per cent. The program for 1931 requires an output of 6,700,000 tons of rolled metal. Consequently, thanks to standardization, we shall produce over 1,000,000 tons of additional output. . . .

It should be noted that the economic significance of the results achieved is not limited to an increase in production, with lower costs. Standardization . . . . creates a new, technically-organized system of production, making possible the concentrating of the production of rolled products, with specialization on definite types and sizes. This is reflected in a reduction in stocks both at plants and at warehouses. As a consequence, funds formerly tied up in stocks are released for use in production. . . .

At the Moscow mill "Serp i Molot" ("Sickle and Hammer"), owing to the standardization of rolling, the daily output has risen from 111 to 198 tons—80 per cent increase—in large sizes; from 32 tons to 67 tons—110 per cent increase—in medium sizes; and from 37 tons to 73 tons—nearly 100 per cent increase—in small sizes.

2

In April, 1930, the Standardization Committee introduced into practice "Unified Standards of Structural Design." The unified standards prescribed new specifications for the construction of buildings (reduction in area, decrease in useless height, etc.); they raised the allowable stresses of iron, lumber, metals, cement, timber; and they reduced dimensions and weights of walls, roofs, and foundations. The new standards of design eliminate the useless margin of strength, utilizing more rationally the properties of building materials.

In applying the new specifications to housing construction and the erection of educational and public health buildings and warehouses, the new standards will effect an economy of some three per cent. In agricultural construction, the new standards will bring about a reduction of about five per cent in cost; industrial construction costs will be reduced by one per cent. On the basis of these figures, it is estimated that the savings in building construction will amount to 300,000,000 rubles (approximately $150,000,000) for the period of the Five Year Plan.

[1] An abstract of an article published in the March, 1931, issue of *Vestnik Standartizatziyi*. Translated by I. Gutmann, Engineering Index Service, New York.

In bridge construction, the reduction in metallic materials due to an increase in allowable working stresses will amount to six per cent, or 25,000 tons, for the period of the Five Year Plan. The reduction in the dimensions of beams used in industrial buildings will save about three per cent, or 72,000 tons of metal; similarly, 3.6 per cent, or 170,000 tons, will be saved in reinforcing steel for concrete buildings. The total saving will amount to 270,000 tons of metal valued at 70,000,000 rubles (approximately $35,000,000). The increase in allowable stresses of lumber and timber will result in savings of six per cent, or 100,000,000 rubles (approximately $50,000,000). Likewise, saving in dimensions of concrete structures will reduce costs by 15,000,000 rubles (approximately $7,500,000) in 1931.

The various items of economy will bring about an over-all reduction of three per cent in total cost of construction. Considering construction statistics for 1931, and assuming an undiminished tempo of construction for 1932, the total saving due to the application of unified standards of structural design promises to reach the sum of 850,000,000 rubles (about $425,000,000) to 900,000,000 rubles (about $450,000,000) or a daily reduction in waste equal to 2,500,000 rubles (about $1,250,000).

When scientific research sets certain limiting values for the properties of materials, the basic assumption is made that these materials are strictly homogeneous; i.e., that they are standardized. If the quality standards of materials are maintained in production, a still greater economy in their use may be expected, since uniform quality insures greater strength and will allow further progress in establishing more perfect standards of structural design.

At present, the Standardization Committee is about to complete a more rigorous set of uniform standards, based on scientific considerations, which will be introduced in the obligatory curriculum of the higher technical schools of the country.

3

At the end of 1930, the Standardization Committee approved a standard on the ash content of coking coal (U.S.S.R. Standard OST 2575). By this standard the ash content of coal should be reduced to two per cent below the average for 1930. This will result in setting free about 60,000 freight cars, and in an increase of 500,000 tons in the production of the metallurgical plants of the union without the least increase in expenditure. The increase in production noted above is due to the fact that an extra ash content of one per cent in coal will reduce the output of blast furnaces by 2.5 per cent, which would thus result in a production loss of 280,000 tons of metal for each one per cent of extra ash content.

At present the local press has undertaken a political campaign among the Donbass and Kuzbass coal miners for the purpose of creating a sympathetic movement, for the purpose of further decreasing the ash content. The paper *Pravda* has assumed leadership in this matter. The Supreme State Inspectorate, which is under the jurisdiction of the Standardization Committee, is in charge of enforcement of the ash content standards.

4

The standardized brick dimensions (U.S.S.R. Standards OST 75, 89, 101), introduced by the Committee during the year 1927–28, reduces cost of brick construction by an average of 3¾ per cent. With the cost of a square meter of wall equal to 27 to 30 rubles (about $13 to $15), the saving amounts to 1.0 to 1.10 rubles (about 50 cents to 55 cents). Using standardized brick, the total saving in 1931 should amount to 70,000,000 rubles (approximately $35,000,000).

5

. . . At the end of last year the Standardization Committee had introduced a new building material—fibrolite (U.S.S.R. Standard OST 2571). Here are the facts about this new material: the manufacture of 1000 pieces of brick requires an investment of 65 rubles ($32.50), while only 13 rubles ($6.50) need be invested to produce an equivalent quantity of fibrolite. In comparison with other building materials, fibrolite is responsible for great saving in construction. Thus, for example, at equal coefficients of heat conductivity one square meter of wall built of brick will cost 27.02 rubles (about $13.50); if built of diatomaceous (Tripoli) brick it will cost 18.54 rubles (about $9.25); and if built of fibrolite it will cost only 14.03 rubles (about $7.00). The production of fibrolite in 1931 will suffice for the construction of 1,665,000 square meters of wall, which will result in a total saving in cost of construction of about 22,000,000 rubles ($11,000,000) for 1931 alone.

6

In the past we had an irrational list of lumber products (inherited from the capitalist system). The Standardization Committee promulgated a standard reducing the number of sizes of lumber (U.S.S.R. Standards OST 92, 93, 608–615). This reform resulted in an economy of 1.5 per cent or 12,000,000 rubles (about $6,000,000) in 1931.

This is not extraordinary; the revision of OST 92 and 93, which is scheduled for 1931,

should result in a further saving of 4,000,000 rubles (approximately $2,000,000). . . .

7

In obedience to the Party mandate to build comfortable, inexpensive dwellings with maximum speed, we have developed standards for wooden houses, which can be built at the rate of 80 rubles ($40) per square meter of wall as compared with 170 rubles ($85) per square meter of wall of masonry construction. As further advantages of this type of construction, we may mention that outside of nails it does not require any other materials which are particularly scarce at present; it requires not more than one-half of shipped materials and one-third the amount of labor; occupancy may commence at the end of three months instead of the customary two seasons; cost of designing is reduced to one-twentieth; and with all this the heat-insulating properties of the standard houses are not inferior to those of masonry construction.

Practice has shown that standard, assembled wooden houses require 40 per cent less material than houses cut to order. . . .

Still, our housing construction practice is assimilating the standardized, assembled wooden house with some difficulty, principally because the mechanical bases for its manufacture are developed conservatively and slowly.

8

Simplification and standardization of window and door sashes, together with substitution of steel for imported brass, has resulted in a saving of 300 tons of brass and 1000 tons of steel, or a total of 4,000,000 rubles ($2,000,000) for 1931. It is also to be noted that prior to standardization (U.S.S.R. Standards OST 2498–2511) we had nearly 300 types of window and door sashes; at present only 30 types are recognized.

Apropos of this it may be mentioned that the standards issued have not done justice to all the possible engineering improvements and innovations in this line. It has, therefore, been found advisable to attract inventive talent by announcing a competition for best designs.

9

The standardization of cigarette packages and the shortening of the hollow mouthpiece (U.S.S.R. Standard OST 536) is expected to save over 9,000,000 rubles ($4,500,000) in 1931. Formerly a package contained 20 cigarettes; at present a package contains 25, which results in a saving of 8.7 kopeks (about 4 cents) per thousand cigarettes. Reducing the number of colors in the picture on the cigarette package, and further simplification, will bring about an annual saving of 2,000,000 rubles ($1,000,000). Packing of first class cigarettes in paper instead of in cardboard will save 1,200,000 rubles ($600,000) per annum. All this is the result of standardization.

10

In 1930 we introduced a quality standard for kaolin used in rubber manufacture (U.S.S.R. Standard OST 1427). This standard reduced the allowable moisture content from 35 per cent to 15 per cent. This alone relieved our railroads from transporting annually 60,000 tons of excess moisture (mere water). On account of this very moisture, as well as on account of inadequate refining, which has also been corrected by the standard, we had imported our kaolin from abroad at an expenditure of 400,000 rubles ($200,000) in international currency. At present we are in a position to reverse the process and may begin to export standard kaolin.

11

Standardization leads production from the path of unnecessary, superfluous variety to socially necessary, socially useful uniformity. We shall illustrate this by the standardization in the shoe industry—U.S.S.R. Standards OST 2615–2616. In lieu of the 150 styles formerly accepted, only 35 are now recognized. Hence the following becomes possible: mass production of shoes and shoe lasts; reduction in dead investment in the form of lasts for sundry unnecessary styles; greater wearing quality of shoes; elimination of disfigurement of feet; etc. It is difficult to give an exact figure for the economy resulting from this, yet at a production of 600,000,000 rubles ($300,000,000) worth of footwear in 1931 and an estimated decrease of five per cent in waste, the saving may amount to 30,000,000 rubles ($15,000,000).

12

The Mikoyan Memorial Shoe Factory at Rostov-on-the-Don rationalized the packing and boxing of shoes. The standard was checked by scientific and experimental methods and at the end of last year it was adopted as an all-Russia standard (OST 2572–2573) for all shoe factories. As a result of this standardization, it is expected that 5,000,000 rubles (about $2,500,000) will be saved in 1931.

13

Last year the Standardization Committee reduced the variety of weavers' shuttles (OST 2348). In the past there were 200 types of these; at present, there are three. The reduction in costs and increase in efficiency of manufacture of shuttles, due to this standard, will appear from the following example: last year

the Kardo-lenta plant had 130 individual orders for shuttles; on account of the multiplicity of types there were practically no two identical orders. For this reason, it was necessary to readjust the production mechanism of the plant nearly twice daily, in some cases as often as three or four times per shift, each such readjustment taking 20 minutes. Thus 1700 man-days were wasted, which is equivalent to about 45,000 rubles ($22,500).

14

Recently, 340 types of grinding disks and abrasive implements were approved in standards OST 2619 and 2632. In the past there were 4040 of them, of different dimensions, etc. The value of annual production in this line for 1932 has been estimated at nearly 60,000,000 rubles ($30,000,000). The standard, having reduced the number of types to one-twelfth of the former number, has lowered cost of production by from five to six per cent, which will result in a saving of 3,000,000 rubles ($1,500,000) in this branch of industry. . . . Along with this reduction in number of types, there has been introduced a new heat treatment process which insures qualitative uniformity of abrasive industry products.

15

. . . Our economic successes in combating waste in the textile industry are particularly significant. This industry, supplying the needs of masses of consumers living under various conditions and climates, and under the influence of capitalistic competition and blatant advertising in the past, has produced perhaps the maximum of excess in types, grades, and patterns of goods.

One need not be astonished, therefore, at the tremendous reductions in textile assortments which standardization brought about, without any detraction from or loss to the real functions and uses of textile fabrics.

The pre-revolutionary assortments of the cotton textile industry reached the figure 3500; at present there are 400. The sharpest reduction in the number of types has taken place in the woolen and linen goods industries. In the combed-wool branch an assortment of 600 items was reduced to 20; 250 thin-cloth items were reduced to 35; 100 heavy-cloth items to 19; and, finally, 2500 linen items were reduced to 180. The economies resulting from introduction of mass production, from elimination of time losses due to resetting of machinery, and from specialization of manufacture are expected to bring about a reduction of three per cent in total cost of production. At an estimated production of 2,200,000,000 rubles ($1,100,000,000) of cotton and linen goods in 1931, the saving due to this standardization will amount to over 66,000,000 rubles ($33,000,000).

16

In the "trifling matter" of pins, and hooks and eyes, the Standards OST 2558, 2559, and 2560 have effected a yearly economy of over 100,000 rubles ($50,000), by reducing the assortment, packing in paper instead of in cardboard, saving 100 tons of metal, and by simplification of marking due to the adoption of the metric system.

17

In another small matter—bottles for acetic acid—Standard OST 2478 prescribes a round form instead of the trihedral. This lowers breakage, reduces weight, and increases the efficiency of their manufacture. The resulting seven per cent reduction in cost of production means a saving of 40,000 rubles ($20,000) in 1931.

. . . This shows that "small-time" standardization is not to be neglected, either.

18

Agriculture, as well as industry, is embraced in planned standardization designed to combat waste. The introduction of standards of selected cultures should increase yields by 15 to 20 per cent, and at the same time should result in an improvement in the quality of grain. At present the National Agricultural Committee of U.S.S.R. is making a study of selected grades with the view of finding the grain of heaviest yield and highest quality, best adapted to the various regions and climatic zones of the country.

. . . The adoption of standard, selected seed would have increased the yield of wheat, in 1930, by 40 000,000 cwt, which is more than the pre-war annual export of wheat from Russia.

II

. . . In some cases, a standard improving the quality of a product may raise its cost of production, but, on the other hand it will give longer service and will bring about a more rational utilization of the raw material, thereby achieving the ultimate aim of standardization; i.e., national economy. This economy may manifest itself in a different sector of industry. In this we differ radically from the capitalist system where the profits of standardization are sought within the same concern and the same undertaking, no further.

. . . Quality is to be planned by means of standards establishing and fixing such qualitative properties, for poor quality is waste . . . and must be combated along broad lines.

. . . It is quite apparent and irrefutable that

standardization conforming to the socialistic development of the Union must become the technology of socialistic construction and be a component of our technological policy. Indisputably, standardization as a principle and a guide to action, being a bridge to large-scale socialistic production, must become one of the cornerstones of our technical progress.

. . . By the end of 1931 our industries will be standardized to the following extent:

	Per Cent
Coal mining	100
Petroleum industry	61.3
Metal mining	60
Ferrous metallurgy	75.5
Non-ferrous metallurgy	70
Chemical industry	74.6
Building materials	91
Machine construction	28.7

. . . We are on the eve of the development of a general plan of a Soviet socialist economic structure and, as Comrade Krzhizhanovsky[2] said, "the first pages must be written by standardization experts."

Undoubtedly, with the aid of standardization, we will take from the arsenal of latest capitalistic technology all of the best that it created in the province of manufacture; furthermore, we shall advance toward the creation of our own technology—the technology of the land of socialism.

III

Our Standardization Committee must fill the function of an organizing center for a mass movement for the reorganization of production and for the combating of waste by means of planned standardization.

This requires . . . propaganda through the press and the moving picture, lectures, scientific demonstrations, and object lessons given at the plants to demonstrate the possibilities of standardization and its applicability to specific problems.

We need placards, exhibitions, slogans—short and impressive. This work should not be conducted in the form of campaigns, but as daily routine persistently struggling for results. . . .

. . . Let us remember that nature does not know of any classless, non-political "pure" science or technology. It is very important to decide to what extent we may rely on standards created and introduced by capitalism when we transplant foreign technology in our country.

There is no disputing the fact that we must introduce models of foreign technology, so long as we have not outstripped the technical successes of capitalism. It does not follow, however, that in transplanting the methods of standardization in our socialistic industry, we must proceed in the fashion characteristic of capitalism.

In capitalistic practice we must distinguish between standards for individual undertakings belonging to one single trust or firm and standards of a national character. The first are a product of the will and organization of one definite industrial group or combine; the second are a result of agreement among various competing groups. We should much rather adopt the standards of trusts and firms, because they reflect best the conquests of progressive engineering—its "last word;" but here we shall invariably clash with monopolies, patents, secretiveness. Automatic adoption of national standards of other countries must be resolutely objected to, because, as a general rule, they have originated from agreement-making and a desire to find a resultant of opposing and conflicting interests. We have no such contradictory conditions; all of our industry in all its subdivisions belongs to the socialistic state and no one else. Owing to our blind following of those abroad, there has thrived among us a most obnoxious notion that since a standard requires a preliminary agreement we must not prepare a standardization plan nor a plan of scientific research. . . . While we were trying to orient ourselves with reference to bourgeois theory and practice of standardization, our tempo of promulgation of standards was exceptionally slow. In 1926–27, 125 all-Russia standards were

Industry	*Number of Standards*
Electric Industry	30
Metals	914
Thermo power	3
Mining	28
Chemical	231
Building materials	30
Ceramic	66
Woodworking	24
Paper	26
Printing	32
Transportation and communication	14
Construction	111
Textile	79
Underclothing and haberdashery	114
Fur and leather	105
Foods and condiments	150
Agriculture	248
Educational and miscellaneous	37
	2242

Number of All-Russia Standards Approved by the U.S.S.R. Standardization Committee during Period of May 7, 1926, to March 1, 1931

[2] Originator of Five Year Plan.

approved; in 1927–28, 221; in 1928–29, 378; and in 1929–30, 1234. The abrupt rise took place in the last year, after we freed ourselves from the idea that a standard must be the product of lengthy negotiations.

We must state, however, that we do not at all deny the principle of agreement, but this principle has with us a different basis and a different significance—a different social meaning. With us the harmonization and standardization projects unify the social interests in individual branches of our economic structure, and the approval of a standard by the Standardization Committee is a synthesis—a summation—of the socially useful requirements of production and consumption.

Our system of harmonization is deep and wide; we have attracted the whole mass of workers to the business of governing the state, and a standard which passes the inspection of the masses, and their criticism, is one of the modes of participation of the workers in the government of our economic structure.

Our following, for a certain period and to a certain extent, in the methodological path of Western European and North American national industrial standardization was merely a matter of non-critical, unquestioning genuflexion before the customs of foreign lands. . . .

We are bound to have our own methodological forms which must reveal the principles of Soviet standardization in opposition to those non-critical strata in our standardization practice which were copied from a bourgeois milieu in spite of its infinite remoteness from our actuality.

Both Western Europe and America—in fact, the whole capitalist world—seeks to find in standardization a means for successful competition of individual capitalists and capitalist combines with one another, and of individual states among themselves. . . .

Even the far-famed specialization and cooperation of production in capitalism originate in the desire to annihilate the small competitor, and for this purpose standardization and mass production are very effective means. . . .

American practicality, to which self-deception would seem least becoming, advances "harmonization of interests" as a stimulus for the adoption of standards—but how can these be thought of where there are classes with opposing, mutually-exclusive interests, where means and tools of production are private property, where national standards are contingent upon an agreement between fighting entrepreneurs.

. . . Our standards will never be mere splinters of the national forms of foreign countries, but will be a product of the creativeness of many millions, of the whole collective group of workers. . . .

Announce Publication of Book on Lumber

Purchasers of lumber, or of wood in any form, will be interested in a new book published by Chandler Cyclopedia, 55 West 42 Street, New York, entitled *Wood—Lumber and Timber* by Phillips A. Hayward. The book includes sections on wood structure, lumber—its manufacture and utilization, the identification of wood, industrial uses for woods, introduction to species, hardwoods, softwoods, miscellaneous tables, standard lumber abbreviations, and a list of lumber associations. There are numerous illustrations.

The author, Phillips A. Hayward, is Wood Utilization Counsel of the National Committee on Wood Utilization of the U. S. Department of Commerce. He has had practical experience in personal operation of a lumber mill, as wood preservation specialist of the C. B. & Q. R. R., as hardwood lumber inspector, and as instructor at the New York College of Forestry.

This book is volume I of a new series of reference works intended to assist in the proper selection, purchase, and use of industrial commodities, according to the announcement by the publisher, and an endeavor is made to collect and present the information from the buyer's viewpoint.

Federal Specifications Board Approves Standards

The following standards have recently been approved by the Federal Specifications Board. Copies may be purchased or borrowed through the ASA Information Service:

Acetone	O-A-51
Boxes; wood, nailed and lock-corner	NN-B-621
Boxes; wood, wire-bound	NN-B-631
Brushes; sash-tool, oval	H-B-491
Brushes; sweeping, floor, hair	H-B-651
Cotton; absorbent	JJJ-C-561
Ether; petroleum	O-E-751
Figs; canned	Z-F-351
Fire-extinguishers; chemical, hand, carbon-tetrachloride-type	O-F-351
Glycerin (glycerol)	O-G-491
Gypsum; calcined	SS-G-901
Hardware; builders' (nontemplate)	FF-H-101
Linoleum; battleship	LLL-L-351
Linoleum; plain, inlaid, and printed	LLL-L-361
Mincemeat	PP-M-351
Pillowcases; cotton, bleached	DDD-P-351
Pipe; concrete, plain	WW-P-371
Sauces; chili and Worcestershire	EE-S-71
Sheeting; cotton, bleached, wide	CCC-S-271
Sheeting; cotton, unbleached, wide	CCC-S-291
Sheets; cotton, bleached	DDD-S-281
Soap; laundry, ordinary	P-S-591
Solvent; dry-cleaning	P-S-661
Waste; wool, colored	DDD-W-116
Watchmen's-report-apparatus	W-W-101

Achievements of the Milk Dealers Association in Ten Years of Standardization Work

The following is an abstract of an address delivered before the Dairy Engineering Meeting sponsored by the Committee on Dairy Machinery of the American Society of Agricultural Engineers, at Cleveland, Ohio, October 23, 1930. Mr. Van Antwerpen, who is chairman of the Committee on Standardization of Equipment of the International Association of Milk Dealers, in his description of the Association's standardization work, presents an excellent example of the methods which may be used by a trade association to improve both its equipment and its product through standardization.

The history of the work of the Committee on Standardization of Equipment of the International Association of Milk Dealers dates back to October, 1920. At that time it was suggested by one of our members that there were various types of equipment which dairymen used that could be standardized, or at least simplified. Following the suggestion, a committee was formed known as the "Committee on Standardization of Equipment." This committee at once began the study of such dairy equipment which might be standardized or simplified to the advantage not only of the milk dealer but also, we hoped, of the manufacturer as well.

The equipment which was considered most in need of simplification was sanitary piping and fittings, cans, bottles, cases, and milk wagons. With the exception of the last item, it is interesting to note how closely, during all the intervening years, the committee held to the program as originally outlined. By means of a questionnaire the committee determined that 90 per cent of the Association members preferred to have them start their work with sanitary piping and fittings. The manufacturers of the piping and fittings were consulted in the hope that they would undertake the job. They replied that, while they realized this was a most desirable thing to accomplish, both for the dealers and the manufacturers, they would not care to undertake to make any change except on a crystallized demand from the dealers themselves. They expressed an opinion that, if any success was to be obtained, it would have to be under the leadership of the milk dealers committee and that with such leadership each and every manufacturer would agree not only to whatever was adopted, but work for that common end.

Very soon the committee learned that there were at least seven different manufacturers of sanitary piping and fittings, not two of which could guarantee that their fittings would interchange with those manufactured by any one of the others, but all agreed that interchangeability was an absolutely necessary and progressive step. The program was conducted cooperatively with the associations of butter manufacturers and ice cream manufacturers. This was not an easy undertaking, nor was it one of quick accomplishment. It was, however, a program of give and take, principally on behalf of the manufacturers and, particularly, of the Creamery Package Manufacturing Company, who alone had to change over entirely from their type of fitting to conform to the standard adopted.

After five years of labor upon this problem, finally all parties interested agreed that the standard fittings should consist of O.D. pipe with square thread, the various gages of the pipe varying according to its size.... As is well known, the standard I.A.M.D. fitting is now the only one that is being manufactured, and all fittings are interchangeable—a most outstanding example of cooperation within an industry. This program was finally closed with the manufacturers and the Association getting together and announcing a standard numbering list, which all manufacturers agreed to adopt for the International Standard Sanitary Fitting.

Temperature Instruments Study

The committee next addressed itself to the question of temperature instruments, which, in cooperation with the various manufacturers of these instruments and the cooperation of other national dairy organizations, started in the year 1923 and culminated in 1925, with the recommendation for standard thermometer spuds for use in coil bats and glass-lined tanks. Several different spuds were used by the various manufacturers for this work. As spuds then existed, Number 1 took care of the $2^1/_4$ in. wall in coil vats, Number 2 took care of the $2^3/_4$ in. wall in coil vats, and others took care of the glass-lined vats. The committee worked on the problem to see if they could not get one spud to serve all three, but found it impracticable. However, all coil vat spuds were reduced to one standard, and another standard for glass-lined

tanks. At the present time, all thermometers are manufactured to fit the standard spuds.

The committee wishes to pay tribute to the Taylor Instrument Company, who, though claiming that their patents covered this spud, threw it open for the use of all manufacturers. They graciously offered to any manufacturer of vats a license to manufacture this spud for a nominal fee.

The following year witnessed the completion of this work and the development of a standard spud for glass-lined tanks, all manufacturers having adopted the Association standard for spuds for glass-lined tanks....

Among other things to which the committee gave its attention was the efficiency of various types of pasteurizing equipment and the studying and remedying of defects therein. Numerous conferences were held with some of the leading milk health authorities of the country, among which were advocates of high-temperature pasteurization. Amazing as it may now seem, statements emanated from some of our leading universities that pasteurizing temperatures of 150 F and above would not impair the cream line. Our committee pointed out at one of these conferences that results from work carried out entirely under laboratory conditions were not fair and suggested that an extensive investigation be undertaken under normal plant conditions. We also recommended that this investigation be conducted to show the impairment of cream line by using a temperature of 142 F as compared to 145 F—30 minutes holding in each case. This recommendation was brought to the attention of the Laboratory Methods Committee who very ably carried out the assignment. Over a period of two years they conducted a most valuable research, submitting a report that is a distinct addition to the literature in the fresh milk industry, with which you are no doubt familiar and which is obtainable in the offices of the Executive Secretary in Chicago.

It is sufficient to say that this report showed the average cream volume on milk pasteurized at 145 F was 13.325 per cent less than the average volume of cream on the same milk pasteurized at 142 F.

Can Necks Standardized

The next major work the committee took up was that of determining upon and recommending, with the approval of the manufacturers, a standard diameter for milk-can necks, which would result in the free interchange of milk-can covers. The committee and the manufacturers of milk cans have recently announced exact and standard dimensions for neck-can diameters of two types: namely, the so-called $6^1/_8$ in. and $7^1/_4$ in. cans. Within the last sixty days, announcement has been made through the Secretary's office of the agreement of all can manufacturers that the diameter of the neck of can for the commercially-known $6^1/_8$ in. size shall measure $6^{11}/_{64}$ in. at the top of the neck, and the diameter of the neck of can for the commercially-known $7^1/_4$ in. size shall measure $7^{18}/_{64}$ in. at the top of the neck; in each case a tolerance is allowed not exceeding plus or minus $^1/_{64}$ in., the taper of the neck to be two degrees from the vertical axis of the can....

While we must all confess that these activities represent very material progress—mostly in the way of simplification to the economic benefit of both the manufacturers and the dealers—it does not represent necessarily the last word in accomplishment toward standardization. The committee stands ready at all times to work further with the committee of the manufacturers toward further reduction and economies as the times and conditions indicate and necessitate....

Cooperation Essential

In this report I have touched only upon the high lights of the work of the committee, time not permitting me to go into any great detail as to our other activities. Those enumerated, I think, have been sufficiently illustrative to tell the story of just what can be accomplished where there is a spirit of cooperation and a great good will and determination to get together. In the years that I have been permitted to serve upon this committee, I feel that I personally, as well as my firm, have profited materially, not only from the knowledge we have gleaned from the discussions with the leading engineers of the country, but from the spirit of great good will and the friendships formed which have more than repaid me for the effort I may have expended to this common cause.

In closing, I want to point out, as I touched upon it in the beginning, that this work was not undertaken nor is it being carried on with any thought of taking away any of the prerogatives of the manufacturers of dairy equipment and supplies. In fact, we have attempted to make it clear from time to time that we wish only to be the servants of these several groups in helping them get together cooperatively and harmoniously by crystallizing our demands as buyers of their product and at the same time acting as an impartial leader for the purpose of enabling the manufacturers to effect economies. The economies thus effected would naturally flow in various ways to the dealers and through simplification of equipment they would enjoy more efficient operation of their plants. If we continue in this work, it will only be at the suggestion of and with the approval of the manufacturers of equipment and supplies for our industry....

A Wear Test to Determine Mechanical Durability of Finishes[1]

by

R. Burns,[2]
Bell Telephone Laboratories

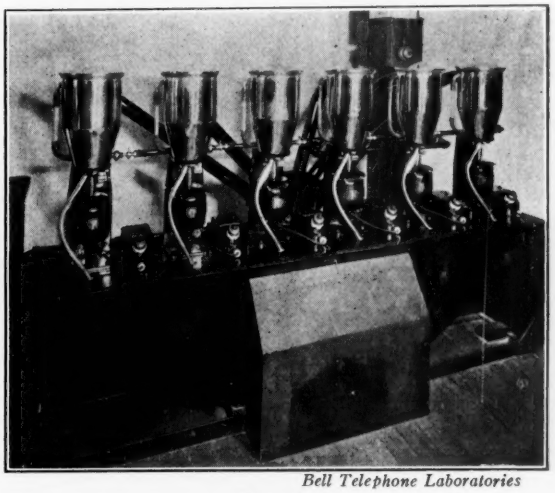
Apparatus developed at the Bell Telephone Laboratories permits direct comparison of wear resistace of various finishes

Many types of standardization have been retarded by the lack of simple methods of test which can be depended upon to give uniform and reliable results. In the following article there is described a test for finishes developed at the Bell Telephone Laboratories which may facilitate the establishment of standards for finishes.

One of the difficulties in selecting proper finishes for use in the telephone plant has been the lack of suitable tests for determining their mechanical durability. Corrosion testing is well developed, but for many applications of finishes resistance to corrosion is not of any great concern; resistance to wear is far more important. The black japan finish on desk stands is a case in point. These are made of brass, so corrosion would be negligible under any ordinary conditions. The real criterion of satisfactoriness of the finish is its resistance to ordinary usage which in a large majority of cases consists mainly of mechanical rubbing or wear.

The need for a practical device to evaluate the wear resistance of finishes has been felt for some time and an apparatus has recently been developed to obtain it. The basic feature is rotation in sand of a disk of material coated with the finish to be tested. A photograph of six of the completed machines is shown in Figure 1, and of a single unit with sand chamber removed, in Figure 2. A four-inch specimen is fastened to the top of a vertical shaft coupled to a vertical motor. A chamber surrounding the upper end of the shaft and the sample is filled with a standard grade of sand to a depth of five inches over the finished surface. A compressed air injector arrangement circulates the sand while the test is under way by taking it from the bottom, and carrying it through an outside tube connection to the upper part of the sand chamber. A suction connection is also made to the upper part of the sand chamber and serves as a vacuum cleaner to remove light waste material. This circulating and cleaning arrangement acts also to cool the surface undergoing wear. After each test, about a quarter of the sand is removed and replaced with new sand, which establishes a constant condition after about 20 tests.

The speed of the surface of the sample relative to the sand varies directly with the distance out from the center of the shaft. The wear, in other words, increases progressively toward the periphery of the disk. Under standard conditions of sand and speed, therefore, the distance from the center to the line of wear is a measure of the ability of the finish to withstand mechanical wear. By multiplying this distance by the number of thousands of revolutions that



Bell Telephone Laboratories

FIG. 1

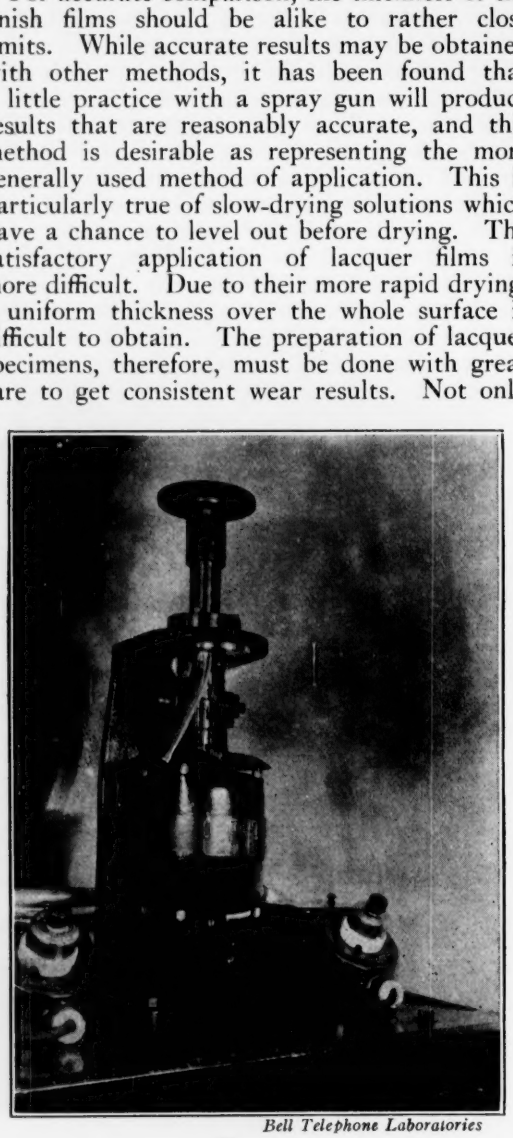
A Unit of Six Finished Testing Machines Developed at the Bell Telephone Laboratories. The Large Pipes Connecting to the Upper Part of the Sand Chambers Are the Suction Connections, and the Smaller Horizontal Pipe at the Rear Carries the Compressed Air for Sand Circulation

[1] Reprinted from the May, 1931, issue of the *Bell Laboratories Record.*

[2] Telephone Apparatus Development Section.

the sample made, a wear index is obtained which is a very satisfactory gage of wear resistance. For metal samples, a speed of 1000 rpm has been found most satisfactory, while for wood, because of the difficulty of getting specimens sufficiently free from warping, 750 rpm has been found more satisfactory.

For accurate comparison, the thickness of the finish films should be alike to rather close limits. While accurate results may be obtained with other methods, it has been found that a little practice with a spray gun will produce results that are reasonably accurate, and this method is desirable as representing the more generally used method of application. This is particularly true of slow-drying solutions which have a chance to level out before drying. The satisfactory application of lacquer films is more difficult. Due to their more rapid drying, a uniform thickness over the whole surface is difficult to obtain. The preparation of lacquer specimens, therefore, must be done with great care to get consistent wear results. Not only



Bell Telephone Laboratories

FIG. 2

A Single Finish-Tester with Sand Chamber Removed but with a Specimen in Place. A Revolution Counter Geared to the Driving Shaft Forms Part of Each Unit

should the finish be of equal thickness over the surface but the specimen on which it is sprayed should have faces accurately parallel and the central hole should be precisely located, and perpendicular to the flat surfaces.

Bell Telephone Laboratories

FIG. 3

The Distance of the Wear Line from the Center Can Easily Be Measured from These Tested Specimens but the Determination of the Wear Index Requires that Readings of the Revolution Counter Be Made at the Beginning and End of Test as Well

The usual practice in the preparation of samples is to spray the desired number of test disks, among which have been placed promiscuously several disks which have been previously measured for thickness. After the finishing processes have been completed the special disks are remeasured and the film thickness determined. Extreme care in obtaining equal thickness of film is desirable for all samples but is particularly so in comparing finishes of the same type, since for them the wear varies considerably with thickness. For finishes of different types, however, thickness is not quite so important. A good baked japan, for example, no matter how thin so long as it "covers" will outwear a cheap bronzing liquid even if made of maximum commercial thickness.

Typical specimens that have undergone test are shown in Figure 3. The standard four-inch disk run at 1000 rpm will serve for a wide range of finishing materials. Inexpensive bronzing liquids carrying aluminum powder as a pigment will wear off rather rapidly. After a thousand revolutions—one minute's run—the wear line will be about half-way out to the periphery of the disk so that the wear index is about one. A two-coat japan finish, on the other hand, of approximately .0005 inch in thickness, will normally run about 15 minutes before the wear line reaches the same point so that its wear index is in the neighborhood of 15.

The design of the apparatus involved some interesting problems. The specimen must be rotated with a minimum of eccentricity and this seemed to require a bearing directly be-

neath the specimen. Since the chamber is filled with sand from several inches below the specimen to five inches above it, this requirement necessitated that the bearing run continuously immersed in sand—a rather difficult requirement for a bearing to meet.

Another difficulty due to the use of sand was the selection of material for the outside connection through which the sand is circulated. In the experimental models this was made of rubber hose and gave very good service. In the refined design, however, metal tubing was employed which soon blasted through at the corners. In the final machines the corners are made of rubber and the straight section of metal, which has proved a very satisfactory combination in service.

To remove the specimen after testing it is necessary to partially empty the sand chamber. For this purpose a quick-opening slide valve was designed, which was gasketed with felt. The pipe shown in Figure 2, bending out diagonally from the bottom of the chamber, is the outlet from this valve and may be extended with hose to conduct the sand to a chamber below the apparatus, or any convenient place.

This apparatus furnishes means whereby the resistance of finishes to mechanical wear can be evaluated on a commercial basis. No feature in its operation is critical, and the apparatus can be used successfully under ordinary shop or laboratory conditions although it is always better, whenever practicable, to make the tests in conditioned rooms.

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Paint Industry Wants Simplified Product

The value to the paint industry of simplification and standardization was pointed out by Charles R. Cook, president of the Cook Paint and Varnish Company, in a recent issue of *Drugs, Oils, and Paints*.

"We cannot hope to develop our formulas, or get uniform production," Mr. Cook said, "by turning out a lot of relatively small batches, in a wide range of different grades, or types of products, and the many colors involved.

"The individual manufacturer can only do this by standardizing on just a few grades, types, and shades and size packages of products which his own business is best individually fitted to most economically produce....

"The first instinct of the salesman is to fight against such necessary simplification and standardization—he always wants to give the customer whatever he wants, regardless of whether it is the economical or reasonable thing to do.

"But, if our products are to meet with increasing favor and use by the great consuming public, our industry, through each representative manufacturer, must 'stand pat' and insist on turning out a really simplified and standardized line.

"The dealer does not really need 32 shades of house paint nor does he really need one-half gallons, nor is there any real demand for a wide variety of shades in flat wall paint, stains, etc., many of which are either slow moving items, or, naturally, tend to settle or deteriorate in the package when held a considerable length of time, as they generally, are on the dealers' shelves."

—

Railway Standardization in India Proves Beneficial

A report on the benefits already accruing from the organization, late in 1930, of a Central Standards Office for railways in India was recently made by T. G. Russell, Chief Commissioner of Indian Railways. The work of the Central Office, headed by a Controller of Standardization, has resulted in a degree of coordination of standardization of all types of railway equipment which was impossible when the various classes of equipment were dealt with by different offices. Mr. Russell mentions as an example the coordination of the work on bridges, tracks, and rolling stock. These are, he says:

"normally regarded as three separate branches of engineering, and yet the absence of close coordination between the three or their failure to advance together, hand in hand, can result, and often has resulted, in heavy financial loss to railways."

He continues:

"As an example of the valuable work undertaken by the Central Standards Office since its formation, I should like to mention the preparation and publication of the standard vacuum brake drawings. The vacuum brake is used exclusively for controlling trains in this country, and the value of the brake equipment fitted to the rolling-stock of State Railways alone exceeds three crores of rupees. When first invented the brake was largely covered by patents and the manufacture of the equipment was limited to the patentees; but since the expiry

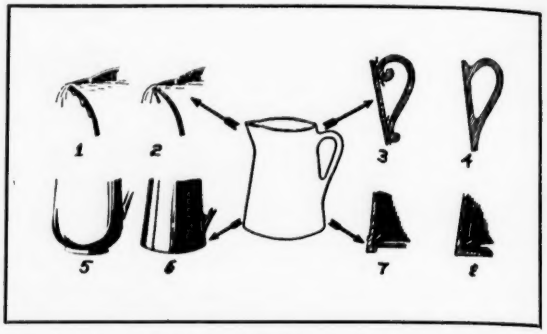
of the original patents, other firms have come into the field. In order to limit competition, as far as possible, both the original patentees and their competitors have consistently refused to issue working drawings of the equipment they manufacture. This jealous guarding of information necessary to the accurate manufacture of the equipment has been so thorough, that besides securing the manufacturers' ends by limiting competition, it has caused the equipment now in use on various railways to be to a large extent non-interchangeable. This lack of complete interchangeability between fittings made by different manufacturers has, in the past, resulted in inflated stores balances, defective working of the brake, and heavy maintenance charges.

"With the issue of the standard drawings to which all equipment will, in future, be made, complete interchangeability is assured, and the manufacture of the equipment, instead of being limited to two or three firms, can be undertaken by any well-equipped engineering firm in India. I need hardly say that railways cannot but benefit financially in consequence.

"As another instance of how economy can be effected by standardization I would mention the East Indian Railway Carriage Underframes Workshop at Tatanagar. Carriage underframes are being manufactured there today at considerably less cost than they can be purchased from any other source. This reduction has become possible due to quantity production following the introduction of standard designs of underframes purchased by all railways, in lieu of the old practice in which each administration purchased underframes to their own particular designs."

Germans Study Correct Design of Household Appliances

Through a special office organized under the Verein Deutscher Ingenieure,[1] the Germans have given careful study to the correct design of household appliances, a topic not treated scientifically in any other country, so far as is known. The appended figure, reproduced from a paper by Dr. Ing. M. Mengeringhausen of the household engineering section of Verein Deutscher Ingenieure, will show the care which has been given to the study of common appliances. In considering the careful study given by Germans to these items and the exceptional interest shown by engineers, it is necessary to remember that German housewives have a very much



A Study of Pitchers Made as Part of a General Investigation of Household Appliances

1. Round edge drips in pouring; 2. the sharp outer edge prevents this; 3. such corners are dirt collectors; 4. rounded corners make possible quick and thorough cleaning; 5. this pitcher tips easily; 6. the broad base prevents tipping; 7. this corner is difficult to clean; 8. therefore on every pot be sure you have rounded corners.

smaller sum to spend on home equipment than do women in this country, and such equipment is invariably of a simpler and less expensive type. Electric refrigerators, and electric clothes and dishwashing machines, are almost unknown, except in very wealthy homes. On account of the lower income levels there is every reason for the consumer to be sure, in so far as he can, that every purchase made will be right, and well adapted to its use.

An excellent reprint discussing the scientific work done along these lines is available on request to any one interested. A booklet is also available describing engineering in the household (*Technik im Heim*) which has an introduction by Dr. Hellmich, director of the Verein Deutscher Ingenieure and of the Deutscher Normenausschuss (German national standardizing body). This booklet also has sections on efficient lighting in the home, good and effective heating, nutrition, technical appliances for preparation of food, stoves and heaters, household engineering in the kitchen, kitchens for country houses, ready-equipped kitchens, and washing of clothing.

Swiss Standards for Thermometers

Fourteen draft standards for industrial glass thermometers are being circulated by the Swiss national standardizing body and are available for loan through the ASA Information Service. The drafts cover thermometers and their accessories for temperature ranges suitable for refrigerating plants, transformers, sugar and oil factories, distillery processes, zinc coating, and other uses.

[1] The German national engineering society. The society includes engineers of all classifications, who do not have separate societies as in this country.

Research Group to Study Conference and Committee Methods

by

Leona Powell[1]

Inquiry staff will assist associations and societies to study their meetings in an effort to increase the value of conference procedures

Among the various ways of getting things done in business and industry, conference and committee action is of recognized importance. Very little conscious effort, however, has been expended on the technique of these conferences, apart from the more obvious features such as the physical environment and some sort of planning of programs or agenda. The management of meetings, large and small, in company administration and in business associations is encountered in all stages of efficiency and confusion. The fact that group action persists through such meetings, notwithstanding the waste of time, money, and patience on those that are badly managed, attests the permanent values of this method of action.

An organized research project for the study of conference and committee action in business and industrial organizations is under way. The present article is based upon a statement of the project recently distributed to collaborators by "The Inquiry," under whose auspices this study is being conducted.

"The Inquiry" is an independent organization which conducts research into problems of techniques of human relationships. Originally interested in studies of race prejudice, international relationships, community relationships, and such problems, the attention of Inquiry researchers was soon directed to the important part played by discussion groups. Over a period of some six or seven years a considerable number of the "Occasional Papers" of the Inquiry and a number of its pamphlet reports—such as *Who Is My Neighbor?* and *What Makes Up My Mind on International Relations?*—have dealt with the discussion method, providing material and suggestions on technique. Closely connected with this work were the studies which resulted in several books, *The Process of Group Thinking* by Harrison S. Elliott, and *Training for Group Experience* and *Creative Discussion* by Alfred D. Sheffield.

[1] A member of the staff of The Inquiry, 129 East 52nd Street, New York, N. Y.

The Inquiry is financed by individuals and foundations interested in the particular kind of research which it carries on.

Inquiry study and experimentation with discussion method has been in the educational and social field, with the exception of an intensive study of technique in joint committee work in the employee representation plan of the American Telephone and Telegraph Company, the results of which are now available for use by The Inquiry staff. Apart from this piece of research, the present project marks the entrance of The Inquiry study of conference technique into the business field. The new project was organized in January, 1931, and will be a two-year study under the direction of Mr. Glenn A. Bowers with the writer as his assistant.[2]

The present Inquiry project is divided into three parts, a study of company conferences, one of conferences in trade and professional associations, and one of employee organization conferences. For the study of associations the professional group will include organizations like the American Standards Association, the American Society of Mechanical Engineers, the American Management Association, the Society of Industrial Engineers, and the Taylor Society.

The nature of this project requires that the cooperating associations should study their own conferences and committees with the assistance of The Inquiry staff. This is desirable because of the fact that the technique of many of the

[2] Both Mr. Bowers and Miss Powell have had extensive practical experience with business conferences as well as theoretical training in research into industrial relationships. Mr. Bowers completed his training for business organization secretaryship in the Harvard Graduate School of Business in 1916 and has since then been engaged in organization work in three different chambers of commerce, in work in industrial relations with the Cleveland, Ohio, Garment Manufacturers Association and the New York Employing Printers Association, and as Director of Research with Industrial Relations Counselors, Inc., of New York. Miss Powell received her doctorate in the field of economics at the University of Chicago and has worked for the past ten years with the United Typothetae of America, the national association in the commercial printing industry, with the New York Employing Printers Association, and with the American Management Association.

smaller groups would be disturbed by the presence of an "outsider," as well as because of the superior understanding that the "insider" has of the meaning of what happens. Standard forms for reporting a meeting have been worked out by The Inquiry staff and will be used by "reporters" in all the associations so that all data will be comparable. Another part of the study will consist of standard questionnaire and interview forms through which will be secured the results of the experience of persons who have been especially active in conference and committee work.

The broad aim of the study is the discovery or reformulation of principles which govern conference and committee action and the conduct of the research in such a manner as to permit full educational values to be shared by the collaborators, with the end in view that these persons and organizations will continue the conscious development of conference procedures after the present project is completed. The main emphasis of the study will be placed on the "inner workings" of conferences and committees, rather than upon the mechanics of the planning and conduct of meetings.

Committee work like that of the American Standards Association is of particular interest to The Inquiry project. Subcommittees arrive at definite decisions in their work and the degree of vital interest on the part of the participants is usually high. This type of conference is at one end of a scale, at the other end of which is found the committee whose sole purpose is to impart information to its members. There are techniques for both of these processes as well as for other purposes for which conferences and committees are held.

In the realm of the unseen influences and forces which determine the outcome of conferences, there are many intangible and variable factors which will defy exact description and isolation in a controllable form. The project may, however, hope to separate those factors which are subject to control from those for which no controls have yet been found. It may reasonably be expected that part, at least, of the mystery surrounding traditional practices of committees and conferences may be substantially reduced, to the lasting benefit of the cooperators in the study.

Book on Standardization Available

Sustaining-Members are reminded that the book, *Industrial Standardization* by R. A. Brady, published by the National Industrial Conference Board, may be obtained through the American Standards Association at a discount of 10 per cent from the regular price of $3.50.

California Law Makes ASA Standard Compulsory

A bill making mandatory the standardization of all fire hose couplings in the State of California in accordance with the American Standard for Screw Threads for Fire Hose Couplings (B26-1925) has just been passed by the State's legislature and approved by the Governor. The action of the legislature follows serious fires in Berkeley and Mill Valley where aid sent from San Francisco was unable to function because the smaller cities used hose coupled with threads different from the San Francisco standard.

The bill provides for the completion of the change-over to the standard in all California municipalities during the next five years. The work is to be carried on under the direction of the State Fire Commissioner. The act applies also to industrial establishments and to property owners having equipment for fire protective purposes. The bill also attacks the problem from another direction by making it unlawful for any firm or corporation to sell in California any fire hose, hydrant, fire engine, or other equipment with threaded parts for fire protective purposes which do not comply with the provisions of the standard. A fine of from $50 to $200, or imprisonment from five to 30 days, or both, is stipulated for violation of the act.

Specifications Recognize Need for Servicing

The importance of adequate facilities for servicing in determining the long-time value of mechanical equipment is recognized in a specification for swinging engines issued by the Division of Standards and Purchase of the State of New York. Under the section "Qualification of Bidder," in addition to the usual requirements, which largely concern the ability of the bidder to manufacture the product in accordance with specifications, there is the following additional condition, requiring of the bidding firm:

> "That it has in operation and has had for at least 12 months prior to the time of bid opening a service station within 200 miles of the using agent, equipped with spare parts, not assembled, which can be furnished within 24 hours.
> "That it regularly employs in its service station inspectors for the purpose of inspecting, at regular intervals, installations which are in operation in the branch territory."

A Tribute to the Work of Dr. Chaney in the Accident Prevention Movement

by

Leonard W. Hatch, *Chairman*
ASA Safety Code Correlating Committee

Dr. Lucian W. Chaney, retiring from Bureau of Labor Statistics, has played important part in development of national safety code program

On May 31, 1931, the United States Bureau of Labor Statistics lost, through retirement, the services of Dr. Lucian W. Chaney. Likewise, ASA has lost Dr. Chaney's active participation in its work, which in the past has proved of such great value.

Dr. Chaney has had an experience rather unusual to the scientist, of attaining distinction in two widely separated fields. For 25 years he occupied the chair of biology in Carleton College, Minnesota, varying this occupation with the more active one of exploration in the Rocky Mountains of Montana. In the course of these explorations he visited several glaciers never before explored and one of these now bears the name of Chaney Glacier.

In 1907, Dr. Chaney became associated with the United States Bureau of Labor Statistics and was almost immediately launched in what may be termed the second phase of his scientific life—the field of accident statistics and accident prevention. At that time the safety movement was in its infancy. In the United States, at least, accident statistics were extremely primitive. There was need of patient research and analysis, and it was here that Dr. Chaney made his great contribution to the national safety movement.

Developed Statistical Methods

For his studies, he took the iron and steel industry, and his statistical report of the accident situation in that industry became a landmark in the history of the safety movement in the United States. It developed and organized accident statistical methods in a way which had never been done before and it helped greatly to stimulate the movement toward accident prevention, particularly in the iron and steel industry.

Although Dr. Chaney's primary activities have been in the field of accident statistics rather than in that of practical safety work, his accumulated knowledge of accident causes and remedies has rendered him a valued adviser to the safety engineer and to organizations active in the safety movement. Of no organization was this more true than of the American Standards Association in the development of its national safety code program. He became interested in the program at the time of its inception. In fact, he took part in the conferences that were held in Washington, in 1918, during which the decision was reached to request the American Engineering Standards Committee, as ASA was then known, to broaden its organization to include a safety group and undertake standardization of safety codes. This interest led to his appointment as an alternate on the ASA Standards Council and also as a member of the Safety Code Correlating Committee.

Dr. Chaney served as the chairman of the Committees on Walkway Surfaces and Wood-Working Machinery, as well as a member of the Committee on Mechanical Power Transmission; Industrial Sanitation; Laundries; Rubber Machinery; Cranes, Derricks and Hoists, and Electrical Safety. As secretary of the Committee on Standardization of Methods of Recording and Compiling Accident Statistics, Dr. Chaney made a valuable contribution to the development of this project.

It was in the committee work that the fine personality, abundance of tact, and the sound judgment which Dr. Chaney possessed, made him such a tower of strength in the advancement of the safety code program.

The Safety Code Correlating Committee, at its meeting on May 27, 1931, passed a resolution expressing the committee's appreciation of Dr. Chaney's long and faithful service and his valuable contribution to the work of the committee and regretting that it is necessary to discontinue his membership.

The entire American Standards Association joins with the Safety Code Correlating Committee in the sentiments expressed in this resolution. It will greatly miss the advice and counsel of Dr. Chaney and is very appreciative of the service he has rendered.

The Relations of Purchasing and Engineering[1]

by

Frank M. Harris[2]

Both purchasing and engineering have been evolving rapidly during the past two generations. Forty years ago purchasing embraced a knowledge of prices and their seasonal and cyclical trends, where and when to buy, and in what quantities, for maximum economy. During the past twenty years, however, the purchasing agent has been confronted with new factors involving the economies of production and distribution in his markets, coupled with fundamental advances in scientific research and in technical engineering.

The old-time purchasing agent with his sound business ability and his trading sense came to talk a new language in which chemistry, mechanical reliability, economies of performance, and technical suitability for a given use are discussed. Steel was no longer just steel; it must satisfy one of the many standards of the national technical societies, in which carbon, phosphorus, and sulphur are specified to one-hundredth of one per cent. Paint was no longer just paint; it must contain certain vehicles and certain proportions of pigments of certain specified ingredients and must pass certain specified tests before and after application. The purchase of all of the common materials of industry was thus complicated by fine technical requirements and standardized specifications, which seriously handicapped the old-time purchasing agent buying on price alone.

In parallel with the growth in the complexity of purchasing, an equally distinct transition was apparent in the engineering profession. The engineer of 40 years ago was a specialist in name only. He designed, bought materials, contracted labor, and supervised construction, supposedly with equal skill, even when he was not called upon to lend a hand with the financing of the project upon which he was retained. With the entry of specialization into his profession, the engineer was confronted with the necessity for skilled assistance in purchasing, in the person of a specialist who knew markets, materials, and vendors, and who could buy wisely.

No feature of purchasing is more important than that of the inspection and testing of materials and equipment. Shall the purchasing agent or the engineer be charged with that? Who shall control the research and development work in the industry concerned? Who shall have the approval of performance bonds, payments on contracts, and guarantees? Who shall accept completed work?

Where these technical decisions are being made by engineers attached to the staff of the purchasing agent, the purchasing department is to that extent becoming an engineering department and to precisely that extent is weakening the authority of the engineer, without relieving him, in the slightest degree, of his responsibility.

If this authority-responsibility measuring stick be applied fairly and fearlessly to coordination problems, the division of duties will be such that none can complain and the millennium will have come.

[1] Presented at the 1930 Convention of the American Electric Railway Association and published in the *Electric Railway Journal*.

[2] Mr. Harris is chief of the Bureau of Specifications and Estimates of the Pacific Gas & Electric Company, San Francisco, California.

Nominating Committee for Council Officers Appointed

A nominating committee to make nominations for officers of the ASA Standards Council for 1932 was designated at the meeting of the Council on June 4. The members of the committee are:

F. M. Farmer, American Society for Testing Materials, *chairman*

E. C. Crittenden, U. S. Department of Commerce

W. J. Serrill, American Gas Association

E. C. Stone, Electric Light and Power Group

C. B. Veal, Society of Automotive Engineers

A. W. Whitney, National Bureau of Casualty and Surety Underwriters

Canadian Association Publishes 1930 Year Book

The 1930 edition of the Canadian Engineering Standards Association Year Book has just been received at the ASA office. This book contains a complete outline of the work of the C.E.S.A. including a list of approved standards, projects, committees, members, international cooperation, methods of work, and progress report.

One of the important pieces of work accomplished by the C.E.S.A. in 1930 was the publication of the revised edition of the Canadian Electrical Code (reviewed in the August, 1930, issue of the ASA BULLETIN). This code is being widely circulated in Canada.

Sectional Committees on Test Methods Submit Annual Reports[1]

Year's activities of committees on classification of coals, zinc coating of iron and steel, and wrought-iron and wrought-steel pipe and tubing

Classification of Coals[2]

During the past year the Sectional Committee on Classification of Coals, functioning under the procedure of the American Standards Association, has continued to collect facts and data on the composition, properties, and uses of North American coals. This phase of the work is now drawing to a close and the grouping of coals into tentative classes has been started under the direction of W. T. Thom, Jr., Professor of Geology at Princeton University and Secretary of the Technical Committee on Scientific Classification. A fund of $2200 has been subscribed by companies and individuals toward defraying the cost of assistance in tabulating, classifying, and charting the data on classification. Mr. Thom is contributing his own time and Princeton University has allotted $500 of departmental funds to the work. Material assistance has been given also by Governmental Bureaus, the National Coal Association, and private corporations with whom members of the sectional committee are connected.

Contact with the Associate Committee on Coal Classification of the National Research Council of Canada has been continued, with the result that the work has been effectively distributed and duplication avoided.

The three technical committees held two group meetings, in Washington, D. C., on November 25, 1930, and in Pittsburgh, Pa., on March 16 and 17, 1931, at the time of the annual meeting of the sectional committee. The next group meeting of the technical committees will be held in Pittsburgh in November, 1931, at the time of the International Coal Conference of the Carnegie Institute of Technology.

The committee reports with deep regret the death of Messrs. D. MacArthur, member-at-large, and W. R. Addicks, vice-chairman of the sectional committee. Mr. Addicks was a staunch supporter of the classification project and his counsel was most helpful.

Mr. C. E. Dobbin, alternate, representing the U. S. Geological Survey, resigned on account of being transferred to Denver, Colo., and his place has been filled by the appointment of Mr. T. A. Hendricks, also of the Geological Survey.

Technical Committee on Marketing Practice (F. R. Wadleigh, chairman).—The Technical Committee on Marketing Practice did not hold any separate meetings during the past year, but has met with the Technical Committee on Use Classification and has served in an advisory capacity.

Technical Committee on Use Classification (W. H. Fulweiler, chairman).—The Technical Committee on Use Classification of Coal held one meeting in Pittsburgh, Pa., on March 17, 1931. In cooperation with the Fuel Committee of the National Association of Purchasing Agents a questionnaire has been prepared requesting data on reasons why the particular coals being used in a given steam plant are considered best adapted for the conditions under which they are being used. Test data, where available, description and analysis of coal, type of stoker, and kind of furnace, are included in the questionnaire, which is to be sent out by the National Association of Purchasing Agents. The committee plans to collect data on the preferred characteristics of coal suitable for nonferrous metallurgical industries; for cement burning; and for domestic use, in particular small domestic stokers; also data will be collected on the upper limit of volatile matter permitted in "smokeless coal."

Technical Committee on Scientific Classification (H. J. Rose, chairman).—The Technical Committee on Scientific Classification held two well-attended meetings in the past year. The conduct of experimental work and collection of data has been continued by the various subcommittees. However, this phase of the work

[1] These reports were presented at the Annual Meeting of the American Society for Testing Materials in Chicago, June 22–26, 1931. The A.S.T.M is sponsor for the projects.

[2] Submitted by A. C. Fieldner, chief engineer of the Experiment Stations of the U. S. Bureau of Mines, Washington, D. C., who is chairman of the sectional committee on Classification of Coals (M20). C. B. Huntress, executive secretary, National Coal Association, Washington, D. C., is secretary of the committee.

has now reached the point where the actual charting of the different North American coals can be undertaken during the coming year.

The progress of the subcommittees of this technical committee during the past year is given below:

Subcommittee I on Nature, Location, and Mode of Occurrence of North American Coals has continued to assemble data on the analyses and physical properties of North American coals, through the help of other agencies. The U. S. Bureau of Mines has completed a new survey of all the mines in the State of Washington and has published the analyses.[3] A subsequent technical paper from the same bureau will give the friability, slacking index, agglutinating value, and low-temperature carbonization assay of Washington coals.

A similar survey for Iowa has been made by the Iowa Geological Survey and published.[4] The Alberta coals are being studied by the Associate Committee on Coal Classification of the National Research Council of Canada. During the coming year the U. S. Bureau of Mines will cooperate with the Research Department of the Anthracite Institute in a survey of the physical and chemical properties of representative sections of the Pennsylvania anthracite field. The U. S. Geological Survey plans to fill in certain gaps that exist in the twilight zones between the different ranks of coal.

Subcommittee II on Methods of Analysis, Origin, and Composition of Coal has completed experimental work in the development of an accelerated slacking test of coal. The method is described and the relation of slacking index to the analysis and rank of a number of typical coals is given in a Bureau of Mines Report.[5]

The investigation of the Parr and modified Parr[6] formulas for computing the mineral matter in coal from the ash, and of the Stansfield graphical method has been completed by the U. S. Bureau of Mines and is being prepared for publication. In the absence of carbonates and other disturbing factors both formulas agree fairly well with the graphical method. The Parr formula tends to give results slightly below the graphical method and the modified formula somewhat above. On the whole there appears to be no advantage in modifying the original Parr formula.

Fish and Addlestone[7] of the Virginia Polytechnic Institute cooperated with the subcommittee in applying the Parr and modified Parr formulas to Virginia coals. They find that neither formula gave as good agreement in unit values as expected until correction was made for the carbon dioxide content of the coals. Correcting for carbon dioxide the original Parr formula gave slightly better agreement than the modified formula.

Although tentative methods for determining friability and agglutinating properties of coal have been used, these methods are not fully standardized. The Bureau of Mines is conducting an investigation of these methods at both the Seattle and Pittsburgh Experiment Stations. Also microscopic studies bearing on the types and the origin of coal are being continued at the latter station.

Subcommittee III on Present and Proposed Systems of Classification has completed its assignment and has been discharged. The subcommittee made a comprehensive study of all the existing systems for classifying coal and developed a scheme for comparing the position of various coals in these systems by means of the Rose Multibasic Coal Chart.

A new committee known as Subcommittee IV on Tentative Classification of Coals under the chairmanship of Mr. W. T. Thom, Jr., has been created. This committee is now engaged in plotting some 10,000 analyses of American coals on the multibasic coal charts.

In order to secure publication and discussion of the work of the various subcommittees during the past two years, arrangements have been made to hold another symposium on the classification of coals at the annual meeting of the American Institute of Mining and Metallurgical Engineers in New York in February, 1932.

[3] *Technical Paper No. 491*, U. S. Bureau of Mines (1931).

[4] *Technical Paper No. 2*, Iowa Geological Survey (1930).

[5] A. C. Fieldner, W. A. Selvig, and W. H. Frederic, "Accelerated Slacking Test for Determination of Slacking Characteristics of Coal," *Report of Investigations No. 3055*, U. S. Bureau of Mines (1930).

[6] Modified for organic sulfur.

[7] F. H. Fish and J. A. Addlestone, "Unit Coal Studies on Some Virginia Coals," *Industrial and Engineering Chemistry*, Analytical Edition, Vol. 3, p. 155 (1931).

Zinc Coating of Iron and Steel[8]

The sectional committee held two meetings during the past year, on October 23, 1930, in New York City and on March 19, 1931, in Pittsburgh, Pa., and submits the following report of its activities:

The meeting on October 23, 1930, was a special meeting called for the purpose of considering the recommendation of Technical Committee II on Sheets and Sheet Products that the Standard Specifications for Zinc-Coated (Galvanized) Sheets (A93-27) of the American Society for Testing Materials be submitted to the American Standards Association for approval as American Tentative Standard. This recommendation

[8] Submitted by J. A. Capp, General Electric Company, Schenectady, N. Y., chairman of the sectional committee on Zinc Coating of Iron and Steel (G8). A. B. Campbell, National Electric Light Association, New York, is secretary of the committee.

was approved at the meeting and on November 6, 1930, was referred to letter ballot of the sectional committee. The vote of the sectional committee on this recommendation resulted in 38 affirmative and one negative votes and six members marked their ballots "not voting." The specifications were accordingly submitted by the sectional committee through its sponsor the American Society for Testing Materials to the American Standards Association on March 4, 1931, together with an accompanying report covering the history of these specifications. The specifications are now before the American Standards Association Board of Examination.

At the October meeting, the sectional committee also decided to request the A.S.T.M. to withdraw from their publications the Proposed Specifications for the Zinc-Coating on Iron and Steel Sheets which were accepted by the Society two years ago for publication as information.

Technical Committee I on Hardware and Fastenings (A. L. Fox, chairman).—The activities of Technical Committee I during the past year have been directed toward the collection of representative samples of commercial zinc-coated products, and their laboratory analysis to determine weight and uniformity of coating. This work has now been practically completed and a tentative draft of specifications for hot-dipped galvanized hardware products has been distributed to the members of the committee and were discussed at the recent meeting in Pittsburgh. These specifications will be redrafted and redistributed to the technical committee for comment and will be recommended to the sectional committee for approval as a proposed tentative standard.

It is expected that the activities of the technical committee during the coming year will include the preparation of specifications for sherardized, electro-galvanized, and Schoop process coatings.

Technical Committee III on Structural Steel Shapes, Plates, Bars, and Their Products (V. F. Hammel, chairman).—Technical Committee III held only one meeting during the past year, a joint meeting with Subcommittee X on Embrittlement Investigation of Committee A-5 on Corrosion of Iron and Steel of the American Society for Testing Materials. This committee is conducting at the Battelle Memorial Institute a study of the embrittlement of structural steel in the galvanizing process. A report of progress was submitted by H. W. Gillett of the Battelle Memorial Institute covering their investigations to date.

The revised Standard Specifications for Zinc (Hot Galvanized) Coatings on Structural Steel Shapes, Plates and Bars, and Their Products (A123-30)[9] which were adopted by the sponsor body, the American Society for Testing Materials, last year were subsequently referred to the American Standards Association and on December 31, 1930, were approved as American Tentative Standard with the ASA No. G8c-1930.

Copies of the revised standard specifications, together with the 1930 report of the technical committee, were sent to a number of companies in England and Germany that are galvanizing structural steel, with the request that they forward any criticisms or comments on the specifications that they may have to offer. Only a few replies have been received so far but this information will be summarized for the committee at a later date.

Technical Committee IV on Pipes, Conduits, and Their Fittings (C. J. Krieger, chairman).—The fourth draft of the proposed specifications for zinc-coatings for iron on steel pipe and fittings prepared by Technical Committee IV was issued in April, 1928, for information and comment. No criticisms, adverse or otherwise, had been received, so, during the past year, the members of the committee were asked to vote on the recommendation that these specifications be presented to the sectional committee for its approval. The necessary affirmative vote was not received.

In view of this, and also of the fact that one of the Member-Bodies of the American Standards Association will shortly present its standard on rigid conduit to the ASA under the proprietary standards method, the sectional committee voted to withdraw electrical conduit from the scope of this technical committee, thus confining its activities to pipes and fittings only. It was also voted that this committee reorganize its personnel to bring it up to date and to make it consistent with its new scope.

Technical Committee V on Wire and Wire Products (J. L. Schueler, chairman).—The various specifications drafted by this technical committee in conjunction with Subcommittee VI on Specifications for Metallic Coated Products of the A.S.T.M. Committee A-5 on Corrosion of Iron and Steel have all been adopted as A.S.T.M. standards. Consideration has been given to submitting the Standard Specifications for Zinc-Coated (Galvanized) Steel Wire Strand (A122-30) to the American Standards Association for approval as American Tentative Standard. Objections have been raised to these specifications as a result of which a special subcommittee has been organized to give them further study.

In view of the objections raised concerning the galvanized strand specifications, another special subcommittee was formed to study other specifications for galvanized wire prior

[9] *1930 Book of A.S.T.M. Standards*, Part I, p. 311.

to their being submitted to the ASA for approval. Both of these special subcommittees are expected to report at a meeting of the committee to be held during the annual meeting of the American Society for Testing Materials in June.

Technical Committee VII on Methods of Testing (E. S. Taylerson, chairman).—Since the reorganization of committee activities reported last year, this committee has been mostly concerned in determining the demand for new investigations and methods of testing.

The research committee is still considering the possibility of developing a laboratory test which will predict service in the atmosphere. Its work is still confined to the simulated industrial atmosphere test, although the influence of salt spray is also under consideration. The apparatus employed is both elaborate and expensive and the program already under way will probably not be completed for several years. The progress to date has not been encouraging although a large amount of work has been accomplished. The difficulty is not entirely due to design and operation of apparatus to enable consistent results to be obtained, but also involves the great variation in corrosion rate encountered in actual atmospheric exposure tests at different locations. It may be necessary to develop apparatus of a more flexible nature in which it will be possible to so vary the influence of a number of corroding agents as to duplicate a particular atmospheric condition. Very little is known of the essential differences in climate encountered in the atmospheric tests of Subcommittee VIII on Field Tests of Metallic Coatings of the A.S.T.M. Committee A-5 on Corrosion of Iron and Steel.

A committee under the chairmanship of Mr. F. M. Crapo is studying the present Methods of Determining Weight of Coating on Zinc-Coated Articles (A90-30). An extensive comparative study has been made of the hydrochloric acid-antimony chloride and the dilute sulfuric acid methods which indicates excellent consistency. Difficulties have been experienced in interpreting the Preece test for wire, hardware, and pipe which has led to the appointment of a special subcommittee under the chairmanship of F. S. Crane, to study the specifications, limitations, and interpretation of the Preece test.

Wrought-Iron and Wrought-Steel Pipe and Tubing[10]

In continuance of the program reported upon last year,[11] the Sectional Committee on Standardization of Wrought-Iron and Wrought-Steel Pipe and Tubing, functioning under the procedure of the American Standards Association, has adopted a basic formula for use in setting up appropriate schedules for pipe wall thicknesses for various pressure-stress relationships. The formula is based on the Barlow formula with modifications to provide for mill tolerance, metal removed in threading, mechanical strength, and corrosion. This formula is as follows:

For pipe of nominal diameter $^1/_2$ in. and over

$$P = \frac{1.75S}{D}(t - 0.1)$$

where P = the internal pressure in lb per sq in., gage;
D = the outside diameter of pipe in inches;
S = the fiber stress in the wall in lb per sq in.;
t = the pipe wall thickness in inches.

The above formula has been shown to offer the following advantages in the computation of pipe wall thickness schedules:

1. Eliminates the use of two formulas;
2. Is itself relatively simple;
3. Permits the selection of one value of P/S for each schedule of pipe wall thickness;
4. Involves a minimum of change in existing pipe standards.

During the meeting of the sectional committee held at Detroit in connection with the 1930 spring meeting of the American Society of Mechanical Engineers, the basic formula was adopted unanimously by the members present. On July 28, 1930, this matter was referred to letter ballot of the committee which consists of 40 members. The vote on this ballot resulted in 25 affirmative and three negative votes while 12 members failed to return their ballots.

As a result of this ballot, the active formulation of pipe wall-thickness schedules was referred to Subcommittees 2 on Pipe and Tubing for Low Temperature Service and 3 on Pipe and Tubing for High-Temperature Service for further consideration. The number of schedules and their corresponding pressure-stress relationships will be selected to suit the needs of the industry. Tentative pipe wall-thickness schedules for one thousand P/S ratios of 25, 40, 50, 70, 105, and 155 have been set up to indicate the application of the formula.

Consideration is being given to the values of stresses allowable in piping for temperatures

[10] Submitted by H. H. Morgan, district manager, Robert W. Hunt Company, Chicago, Ill., chairman of the sectional committee (B36). Sabin Crocker, designing engineer, Detroit Edison Company, Detroit, Mich., is secretary of the committee.

[11] *Proceedings*, Am. Soc. Testing Mats., Vol. 30, Part I, p. 185 (1930).

above 750 F for use in connection with the basic formula and the cooperation of Subcommittee XXII on Valves, Fittings, Piping, and Flanges for High Temperature Service, of Committee A-1 on Steel of the American Society for Testing Materials, has been invited. Subcommittee XXII has referred this request to a subgroup with instructions to report at the June meeting.

Elimination of the $3^1/_2$ in. nominal pipe size from all ASA flange standards has been under consideration by the Sectional Committee on Pipe Flanges and Fittings. It was recognized by that committee, however, that the cooperation of the pipe trade must be secured before such an elimination could become effective. The members of this sectional committee were invited, therefore, to decide their position in the matter by a letter ballot, the outcome of which is not yet available.

In connection with the work of this sectional committee, Subcommittee IX on Steel Tubing and Pipe, of Committee A-1 on Steel of the American Society for Testing Materials, is preparing specifications for riveted, lock-bar, forge-welded, electric-resistance-welded, and electric-fusion-welded pipe.

Leather Belting Scope Formulated by Committee

The scope of the work to be undertaken by the sectional committee on standardization of leather belting (B42), recently organized under the procedure of the American Standards Association, was formulated at a meeting of the committee on May 14. The scope as approved by the committee is as follows:

> Specifications for vegetable tanned leather belting, including raw material, construction, marking, physical, and chemical tests.

Work on this subject had in the past been done under ASA auspices by the conference method and as a result of this preliminary work, it was found that Federal Specification 37 on Leather Belting would be a suitable working basis for the establishment of an American Standard. Certain revisions, however, were considered desirable by the experts, and a sectional committee was organized to take care of such revisions. At the meeting of this sectional committee on May 14, at which the scope of the project was formulated, it was decided that rules for the installation, care, and maintenance of leather belting should also be comprised in the specifications to be established. As this subject is, however, different from the quality and test specifications for the belts, comprised in the Federal Specification, it was decided that the rules on installation, care, and maintenance would be added in an appendix to the standard proper. At the meeting, which was presided over by L. K. Sillcox, chairman of the Standardization Committee, American Society of Mechanical Engineers, J. C. Mattern, Singer Manufacturing Company, was elected chairman, and H. E. Whiting, Whiting Leather and Belting Company, was elected secretary of the sectional committee. Two subcommittees were organized, one to deal with the quality specifications, and one with the appendix to the standard.

The American Society of Mechanical Engineers is the sole sponsor for the sectional committee on leather belting.

Committee Will Prepare Test Code for Refrigerators

The subcommittee on tests, of the sectional committee on specifications for refrigerators (B38), which recently completed a draft standard test code for ice refrigerators, has been reorganized in order to undertake similar work for automatic refrigerators. The reorganized committee has held one meeting, at which it was decided to provide tests for the determination of five principal elements of performance, as follows:

Ambient temperature under standardized conditions

Internal temperatures

Power input (electricity, gas or other fuel, and water)

Proportion of time in operation

Number of cycles of operation in a unit of time

The chairman of the sectional committee, Charles H. Roe of the Electrical Testing Laboratories, is also acting as chairman of the subcommittee.

Scope for Proposed Project on Clean Coal Suggested

In connection with the request for the initiation of a project to establish specifications for prepared bituminous coal, the Standards Council, at its meeting on June 4, referred the request to the Mining Standardization Correlating Committee for comments and suggestions regarding the initiation of the proposed project. It has

been announced that the following suggestion for the scope of the proposed project has been received from the American Institute of Mining and Metallurgical Engineers, who requested the initiation of the project:

> Specifications outlining allowable limits of extraneous foreign matter in any size of prepared bituminous coal; the minimum size to be covered by standards; the maximum amount of undersize and oversize allowable in each size.

Committee on Foundry Equipment Organized

The sectional committee to undertake the standardization of foundry equipment, which was authorized at the meeting of the Standards Council on December 11, has now been organized and its first meeting was held on May 14, in New York. E. S. Carman, president of Edwin S. Carman, Inc., was elected chairman of the committee, and John J. Baum, development engineer, Steel Founders Society of America, New York, secretary. The project is under the joint sponsorship of the American Foundrymen's Association and the American Society of Mechanical Engineers.

It was decided at the meeting of the committee held on May 14 that the work will be divided between three subcommittees, as follows:

> *Subcommittee 1*—to deal with (*a*) pattern plates; (*b*) molding machine parts affecting interchangeability of patterns; (*c*) flask pins and holes; (*d*) general dimensions of stock flasks for jobbing work.
>
> *Subcommittee 2*—to deal with (*a*) ladle and ladle shank sizes; (*b*) ladle sleeves, stoppers, and nozzles.
>
> *Subcommittee 3*—to deal with (*a*) stock coreprint sizes, shapes, and finish allowances; (*b*) pattern markings; (*c*) rapping plates; (*d*) fillet sizes; (*e*) dowel pins for metal patterns and metal core boxes.

Recommendations were made at the meeting for invitations to be sent to various organizations in addition to those which have already appointed representatives or have been invited to do so. At the present time the membership of the committee consists of representatives of the following organizations:

American Foundrymen's Association
American Society of Mechanical Engineers
American Institute of Mining and Metallurgical Engineers
American Refractories Institute
Copper and Brass Research Association
Electric Steel Founders' Research Group
Gray Iron Institute, Inc.
The Institute of Boiler and Radiator Manufacturers
Malleable Iron Research Institute
National Association of Manufacturers of Heating and Cooking Appliances
National Association of Ornamental Iron Bronze and Wire Manufacturers
National Founders Association
New England Foundrymen's Association
New England Stove Manufacturers Association
Pacific Coast Founders Association
Steel Founder's Society of America, Inc.
U. S. Department of Commerce
U. S. Navy Department
U. S. War Department

Grandstand Collapse Shows Need for Safety Code

Further evidence of the pressing need for the safety code for grandstands (Z20), on which an ASA sectional committee has just begun work, is found in a grandstand collapse which occurred at Gary, Indiana, on June 8, during a celebration of Gary's 25th anniversary. According to the Associated Press, more than 50 persons were injured, 13 of them seriously.

The accident was attributed by city authorities to the undermining of the foundations of the stand by heavy rains. The stand, it was stated, was constructed on a sandbank.

Commenting on the collapse, the *Louisville Courier-Journal* said editorially a few days later:

> "Doubtless the multitude and value of Gary's manufactured products; its payroll; its parks, streets, and sewer improvement; its size and wealth; its investment in schools and all the material things in which communities exult were impressively advertised; the floats were perfected to the last detail; the costumes, lighting, and figures of the pageant given the most careful attention; but the contractors who erected the grandstands almost were allowed to 'get away with murder.' People were invited to go out and sit upon something that wouldn't support their weight."

Two other recent grandstand crashes were described in the May issue of the ASA BULLETIN. In one, 250 persons were injured; and in the other, a stand being used for the first time collapsed, injuring 50 persons.

Sectional Committee Will Undertake New Study of Preferred Numbers

by

John Gaillard, *Mechanical Engineer*
American Standards Association

System recommended in 1927, together with new data, criticisms, and suggestions, will be basis for future American Standard

In 1927 the American Standards Association published a system of preferred numbers, with a recommendation to American industry that it be given a try-out in practice, the entire subject being a rather novel one. In fact, the use of preferred numbers has been given due attention only since national standardization became of importance in most industrial countries, not long after the Great War, although the French Colonel Renard had studied the problem as far back as 1875 with regard to cables for captive balloons. Being in charge of the Military Aircraft Section, he found that 425 different types of cables were used for this purpose, and he reduced this number to 17 on the basis of preferred numbers.

Preferred numbers are based on the principle that in order to cover a certain range of sizes, ratings, values, etc., the most effective stepping-up of the several members of the series should be in a geometric ratio. That is, each number should be larger than the preceding one by a definite percentage. The significance of such a system will at once become apparent if we visualize, say, a series of motor ratings extending from 1 to 250 hp. If in this series the ratings 10 and 100 appear, it is obvious that with 12.5 the next larger rating above 10 hp, the next larger rating above 100 hp should be 125. In fact, whereas a stepping-up by 2.5 hp means 25 per cent of the rating of the 10 hp motor, it would hardly mean anything in the case of the larger motor.

Change-Over Not Always Justifiable

Evidently there are many cases in engineering design and industrial production where the application of preferred numbers, although possible in principle, must give way to the requirements of existing practice for reasons of economy. It cannot be expected that, in setting up certain standards, industry will scrap valuable tools or equipment for the sake of changing over to a new series of sizes just because this is an ideal one. On the other hand, however, there are many cases in which existing standards are revised where the series of preferred numbers can be followed without any difficulty. The purpose of the ASA publication of 1927 was, therefore, to recommend that American industry first try out the use of the proposed preferred numbers system in cases of the latter kind, and also in cases where standards for new objects are being set up; that is, where no existing practice limits the freedom of choice in dimensions, ratings, etc.

Use of Preferred Numbers by Industry

Although very useful and interesting applications of the preferred numbers system have been made by several industrial organizations since the ASA recommendation was published in 1927, it cannot be said that the principle has been given as much attention as it deserves. For this reason ASA has decided that the subject should be given renewed consideration, and that with this end in view the original committee that made the recommendation will be reorganized into a regular sectional committee under ASA procedure. The new committee will review the recommendation of 1927, together with any data which have become available regarding the application of the recommendation, and suggestions and criticisms received in this respect. To the latter classification belongs a suggestion that it might be well to work out a series of preferred numbers in fractional sizes also, to be in parallel with the 1927 series which was worked out in decimal values exclusively. This, and other questions which may come up, will be given due attention by the new committee.

An article entitled "Experiences and Suggestions Relating to the Preferred Numbers System," dealing in greater detail with the subject of preferred numbers, together with a statement by the chairman of the special ASA committee on preferred numbers were published in the January, 1931, issue of the ASA BULLETIN.

STANDARDIZATION WITHIN THE COMPANY

German Manufacturer of Sheet-Metal Articles Makes Effective Use of Standards

by

F. J. Schlink, *Contributing Editor*
ASA BULLETIN

Factory standardization work based largely on national standards has resulted in economies and improvement of products

The Krauss Works (Krausswerke, Schwarzenberg, near Chemnitz, Saxony, Germany) manufactures various types of sheet-metal articles including bath tubs, hot-water bottles, washing machines (hand and electric operated), oil cans, and other items.

In connection with one item of the factory's production—motorcycle gas tanks—Mr. Krauss, the owner of this Works, reports a serious difficulty in production owing to lack of standardization in the methods used by motorcycle manufacturers in attaching the tanks to the frames of the machines. The customary practice has been to set a threaded nipple into the wall of the tank at various points. Into these nipples the machine screws for fastening the tank have been fitted. The location of these nipples has differed with practically every manufacturer of motorcycles and has made a difficult problem for the producers of the tanks. Moreover, the construction was not satisfactory from the point of view of mechanical design, because the vibration of the motor tended to loosen the nipple at the point of its joining the thin sheet metal of the tank, so that leaks developed there. Not only were the positions of these nipples not standard, but the size and threading of the holes also varied in the different designs.

The first difficulties have now been disposed of by welding onto the outside of the tank, in a shallow, rectangular depression provided for the purpose, a straight strip of metal, into which the necessary holes for attachment of the tank to the motorcycle frame can be drilled and threaded at any desired position without calling for change in the more difficult matter of location of holes in the tank itself. As a result, the tanks can be built for stock to a much larger degree than was hitherto possible. A difficulty which remains, however, is the fact that the nipples through which the fuel or oil flow to the motor are also not standard among the different makes. This single point of special fitting upon order from the manufacturer greatly hampers the ability of the tank manufacturer safely to build large numbers of tanks for stock.

Years ago there were made, in this factory, no less than 50 kinds of oil cans. Now there are four and these have been proved by experience to meet, in a most satisfactory way, all the requirements of the user. Two types are each made in five capacities; and the other two types each in only one.

Make One Size Hot-Water Bottle

Formerly, the metal hot-water bottles made in this factory were made in six sizes having lengths of 24 cm, 26 cm, 28 cm, 30 cm, 32 cm, and 34 cm. Subsequently, the sizes 28 cm and 30 cm, at the middle of the range, were adopted and were put into use without difficulty. The mean of all sizes; viz., 29 cm, is now used and found to cover the customers' requirements quite satisfactorily.

Experience seems to indicate that the distributor is not able effectively to express the desires of the consumer in respect to the adoption of standard sizes for common household articles of this type. The distributor, according to this exceptionally well-informed manufacturer, is in no sense an expert on problems of utilization of tools and equipment. He hears objections registered by users but these objections are not necessarily representative or properly weighted from the point of view of the performance of the device or appliance as a whole. Objections may often be based upon irrational points such as antagonism to change on the part of the craftsman or householder, who gets into the habit of using certain forms and thereafter comes to prefer them, without realizing their technical disadvantages. Experience has shown in this factory, which deals extensively with hardware jobbers and re-

tailers, that the distributor is well satisfied to accept the manufacturer's views on changes in and simplification of designs, provided that when standardization is accomplished the resulting product is either available at a lower price or in better quality. The Krauss Works consider that they have been able to follow this practice pretty consistently in their standardization work.

The owner of this plant is enthusiastically in favor of the national standardization movement. He expressed himself to the effect that he always used the national standards or specifications for purchase whenever possible because the stamp of the German national standards committee gives him an assurance—and a most essential one—that the standard represents not the *ex parte* view of one of the parties interested but the balanced judgment of all groups concerned, providing for the proper needs of the manufacturer when acting as consumer of the goods in question, as well as of the producer and his technical experts.

Mr. Krauss has applied the German standards for the identification of piping, DIN 2403, to the water, steam, gas, vacuum, and other piping in his residence, in which he has also carried out, in a remarkable way, many other principles of standardization and rationalization, as well as hundreds of other applications of modern techniques hitherto not applied in residence planning.

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Standard Bolts and Nuts Now Widely Used

The widespread use of American Standard bolts and nuts is described by the president of one of the largest bolt and nut manufacturing companies in the United States in a letter to Lieutenant Commander H. A. Spanagel, United States Navy, who is chairman of subcommittee 2 on wrench head bolts and nuts of the ASA Sectional Committee on Bolts and Nuts (B18). Some of the interesting statements made in the letter are:

"The Lamson & Sessions Company is using the American Standard dimensions to all of the tables except No. 2, which we do not make, and No. 7, for which but little demand has developed.

"We are still furnishing a great many nuts in United States standard sizes, and, of course, make many special size nuts for customers who require them.

"The status of the use of the standards as I see it is as follows:

"Table 1 is being used for an overwhelmingly large proportion of the bolts made; I would estimate 98 per cent.

"Tables 3 and 4 are being used for all of that product as far as I know.

"Table 5 is used for all nuts regularly furnished with bolts. These constitute much more than 50 per cent of the total nuts used.

"The standard sizes are also being used by many railroads and large consumers—the names of the Pennsylvania Railroad and the Otis Elevator Company occur to me immediately—and I think more of our industrial customers who buy nuts separate from the bolts are using these sizes than are using the United States Standard.

"Hexagon light nuts are used universally by the automobile trade and to some extent by others.

"We are making all of our machine screw and stove bolt nuts to American Standard dimensions."

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Versatility plus Standardization

"Machines that are designed to make only one size and type of article, and cannot be adapted to other purposes, undoubtedly pay their own way in many cases. But the chances of doing a profitable business with a versatile machine adaptable to a considerable variety of jobs is far greater. This fact is quite generally appreciated.

"What seems to be less apparent to some is that reasonable forethought and a fair degree of standardization within a plant often will enable it to build a full line of versatile machines from comparatively few parts.

"At least one manufacturer of machine tools is now working on a program of this kind. He expects to build a line of machines to handle both bar and chucking work that will have close to seventy-five per cent of interchangeable parts. With these and only four different frames, and perhaps 25 per cent of parts that are not interchangeable, his line will be able to handle about 90 per cent of the production work done on this class of machines. Yet all of the machines will be highly efficient.

"As against this, some competitors are said to offer machines involving more than a dozen different frames and a much larger diversity of parts, with no greater range of work. Can it be doubted which of these companies will have the lower average unit cost, and consequently will be in the better position to meet competition?"—*Editorial reprinted from the March 26, 1931, issue of the American Machinist.*

Small Tool Standardization Brings Economies

One of the forms of standardization which is believed by many engineers to be most productive of immediate and direct savings is that of small tools. This view is supported in an article in a recent issue of *Automotive Industries*, in which K. T. Keller, vice-president and general manager of the Chrysler Corporation, states that more standardization is the outstanding problem in connection with small tools at the present time.

> "The elimination of needless multiplicity (of small tools)," he says, "can in itself produce considerable reductions in the over-all cost of production. An example in point is the standardization work that has been carried out among the plants of the Chrysler Corporation. By the standardization of spindles and guards it has been possible to reduce the number of different types and sizes of grinding wheels by approximately 26 per cent during the past year, and indications are that another year will see this figure increased to about 50 per cent.
>
> "Such standardization work results not only in a reduction of stock to be carried, thereby reducing the overhead, but also enables a shifting of small tool equipment from a relatively idle plant to a more active plant within the corporation. The extension of such standardization work throughout the automotive industry by cooperation of the various manufacturing companies would react to the mutual benefit of all concerned. The manufacturer of the equipment would benefit by the reduction in variety it is necessary for him to produce and stock. The users would benefit in the same direction, while disposal of excess varieties of one size or type of equipment which proves unnecessary at a time of a design change would be made possible within the manufacturing companies of the industry. Such interchange is now already being conducted on a small scale between a few companies with considerable mutual benefit."

An important contribution to this whole subject is being made by the ASA Sectional Committee on Small Tools and Machine Tool Elements (B5) which has been at work for some years under the sponsorship of the American Society of Mechanical Engineers, the Society of Automotive Engineers, and the National Machine Tool Builders Association. Subcommittees of this committee have already completed standards for t-slots, their bolts, nuts, tongues, and cutters; tool holder shanks and tool post openings; milling cutters; and cut and ground thread taps, and are now working on 12 other divisions of the general subject of small tools and machine tool elements. The work of this committee, by making available to all industries and to all plants both large and small authoritative national standards for small tools and machine tool elements, may be expected to result in widespread economies in industrial production.

Related to the subject of tools is another statement by Mr. Keeler in the article referred to above. He says:

> "Engineering standardization in the case of the Chrysler Corporation enables an interchange of parts between idle and busy plants in the same manner as was made possible by the standardization of minor production equipment and accessories. In this program the production man has been playing a more and more important part, since it has become increasingly essential that engineering design be of such a nature as to present the minimum of difficulties in tooling up for production, or in changing over existing production equipment. In the Chrysler Corporation it quite frequently happens that changes in design, especially of minor parts, will originate in the production division. The only requirement is that these designs conform with the appearance and performance standards established for them by engineering."

Council Defines Functions of Committee on Procedure

The following resolution defining the functions of the ASA Committee on Procedure was adopted at the meeting of the Standards Council on June 4:

> The Committee on Procedure shall consider all matters relating to proposed amendments to, or interpretations of, the Constitution, the By-Laws, and the Procedure, and shall report its recommendations to the Council.

Meeting Date Changed

The next meeting of the ASA Standards Council will be held on September 10 instead of September 17 as originally planned.